RC FH

GB Installation and user manual / 01

EMMETI

GB

Thank you for your choice of ELECTRONIC CLIMATIC ADJUSTMENT KIT RC FH. Carefully read this manual which contains the specifications and all useful information for correct operation of Thank you for your choice of the ELECTRONIC CLIMATIC ADJUSTMENT KIT RC FH.

1 Description 4

1.1 Function 4
1.2 Fields of use 4
1.3 Kit composition 4
1.4 Application diagrams 5
1.4.1 Thermoregulation with mixing valve and servo-control 5
1.4.2 Thermoregulation with Floor Control Unit 6
1.4.3 Thermoregulation with Firstbox 7

2 Installation 9

2.1 Three-way mixer valve 9
2.2 Servo-control 9
2.3 Flow probe 10
2.4 Flow probe on Floor Controlbox 10
2.5 Flow probe on Firstbox 10
2.6 Safety thermostat 11
2.7 External sensor 11
2.8 Room remote control 13
2.9 Climatic adjustment device RC FH 13
2.10 Control unit 16
2.11 Wiring - General rules 17

3 Operating elements 19

3.1 Commissioning 19
3.1.1 Control Unit 19
3.1.2 Getting Started 19
3.1.3 Language setting 19
3.1.4 Functional checks 20
3.2 Methods of use 23
3.2.1 Instructions for use Control unit 23
3.2.2 Instructions for use Room remote control . 26
3.3 Programming 27
3.3.1 General rules 27
3.3.2 Setting date and time 27
3.3.3 User levels 30
3.4 Programming of heating hours 31
3.5 Display of parameters 32
3.6 Detail of parameters 44
3.6.1 Date and time 44
3.6.2 Control unit 44
3.6.3 Programming 45
3.6.4 Heating circuit 45
3.6.5 Configuration 53
3.6.6 LPB system 55
3.6.7 Errors 58
3.6.8 Maintenance / Service 58
3.6.9 Inputs/outputs test 59
3.6.10 System status 59
3.6.11 Diagnostics consumers 59
3.6.12 List of displays 60
3.7 Adjustment and balancing of the system 62
3.8 Protective functions of the system 62
3.9 Operating anomalies 63

4 Interface LPB Open Therm 64

4.1 Instructions for installation and use

5 Connection diagrams 66

1.1 Function

The adjustment device managers a heating circuit controlled by a three-way mixer valve and circulator pump.

1.2 Fields of use

Residential and non-residential buildings, with floor heating, radiators, fan coils.

1.3 Kit composition

The kit is composed of the following components:

a) Control unit

b) Climatic adjustment device RC FH

c) External probe

d) Remote control with room sensor

e) Flow sensor

f) Connectors kit

Mixing valve is not supplied. It should be selected according to the plant features.

1.4 Application diagrams

1.4.1 Thermoregulation with mixing valve and servo-control

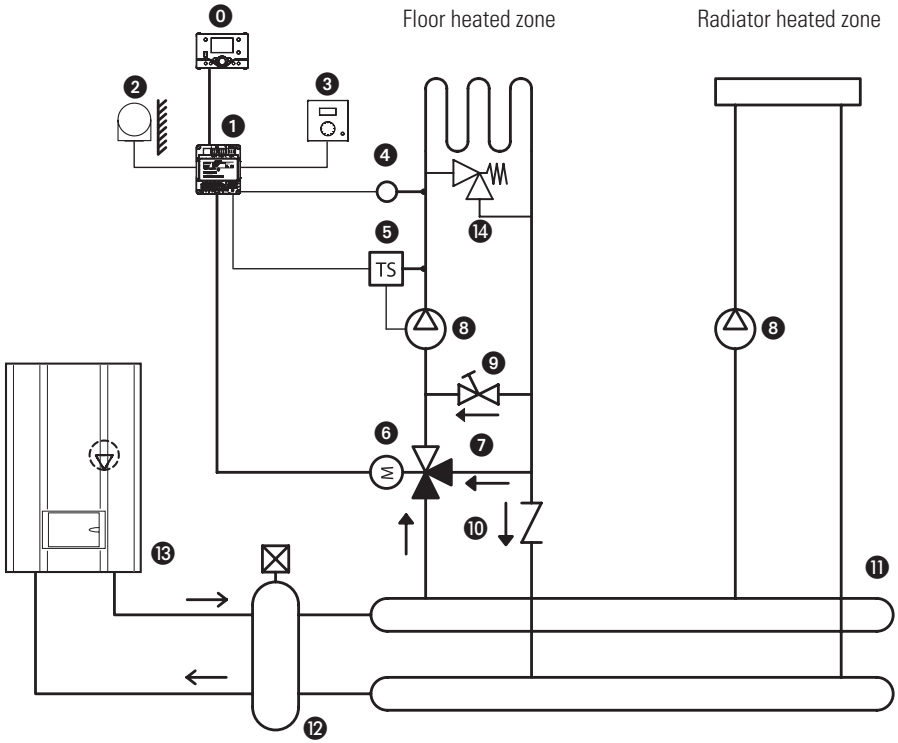


Fig. 1

0 Control unit
1 Climatic adjustment device RC FH
2 External probe
3 Remote control with room sensor
4 Flow sensor with well
5 Safety thermostat
6 Servo-control for mixer valve
7 3-way mixer valve
8 Circulator pump
9 By-pass calibration lockschield
10 Non-return valve
11 Main manifold
12 Hydraulic separator
13 Boiler
14 Overpressure valve

1.4.2 Thermoregulation with Floor Control Unit

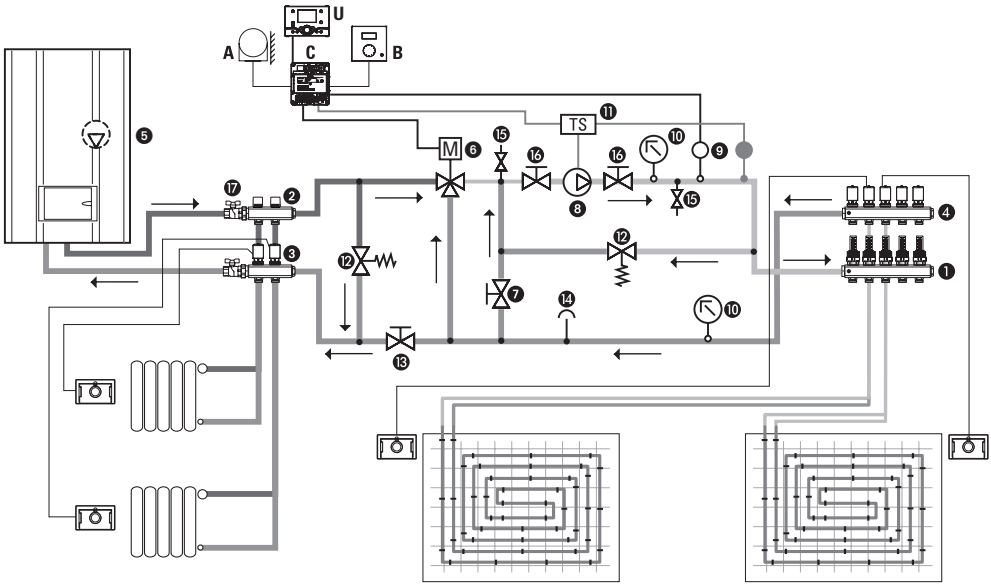


Fig. 2

1. Flow bar for floor heating plant with regulation lockshields
2. Flow bar for radiator heating plant
3. Return bar set up to take thermoelectric heads (radiator plant)
4. Return bar set up to take thermoelectric heads (floor plant)
5. Boiler
6. Servo-control and adjustment valve
7. Setting and by-pass valve
8. Circulator pump
9. Flow pipe probe
10. Control thermometers from 0 to 80 °C
11. Safety thermostat in box and electrical connection to the circulator pump
12. Overpressure valve (from 0,1 to 0,5 bar)
13. Cut-off and balancing lockshield
14. Automatic air bleed valves 1/2'
15. Drain bibcocks with adjustable connection and safety plug
16. Pump isolator ball valves
17. Kit valvole con by-pass

A External probe - **B** Remote control with room sensor - **C** Climatic adjustment device RC FH - **U** Control unit

1.4.3 Thermoregulation with Firstbox

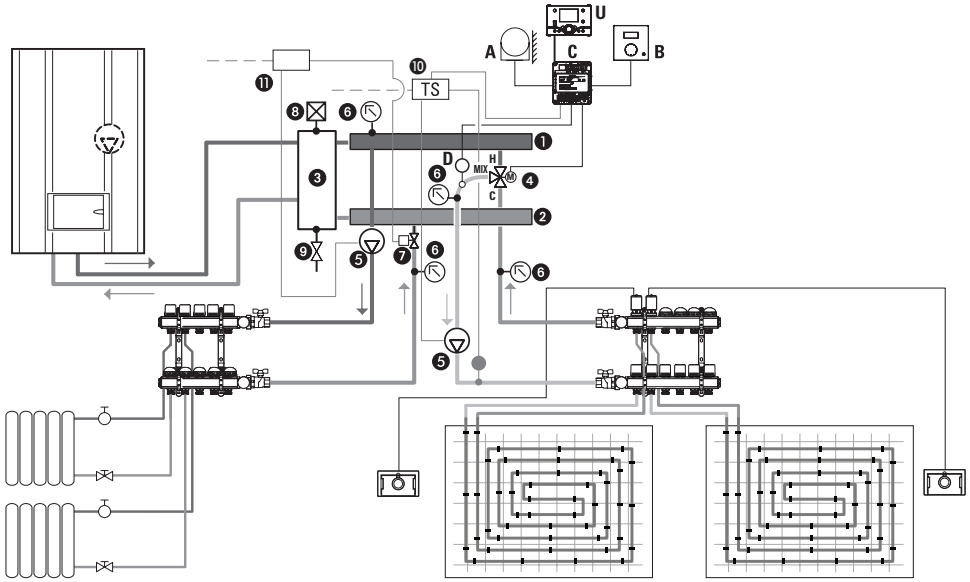


Fig. 3 - Modules whit open manifolds

1. Flow bar
2. Return bar
3. Open manifold
4. 3-way mixer valve with electric servomotor
5. Shark circulator pump N 6/53
6. Control thermometers from 0 to 80 °C
7. Adjustment/cut-off valves set up for electrothermal heads
8. Automatic bleed valves 1/2'
9. Drain bibcocks with adjustable connection and safety plug
10. Electrical box with safety thermostat for wiring of low temperature circulation pump
11. Electrical box for wiring of high temperature circulation pump

A External probe - **B** Remote control with room sensor - **C** Climatic adjustment device RC FH - **D** Flow pipe probe - **U** Control unit

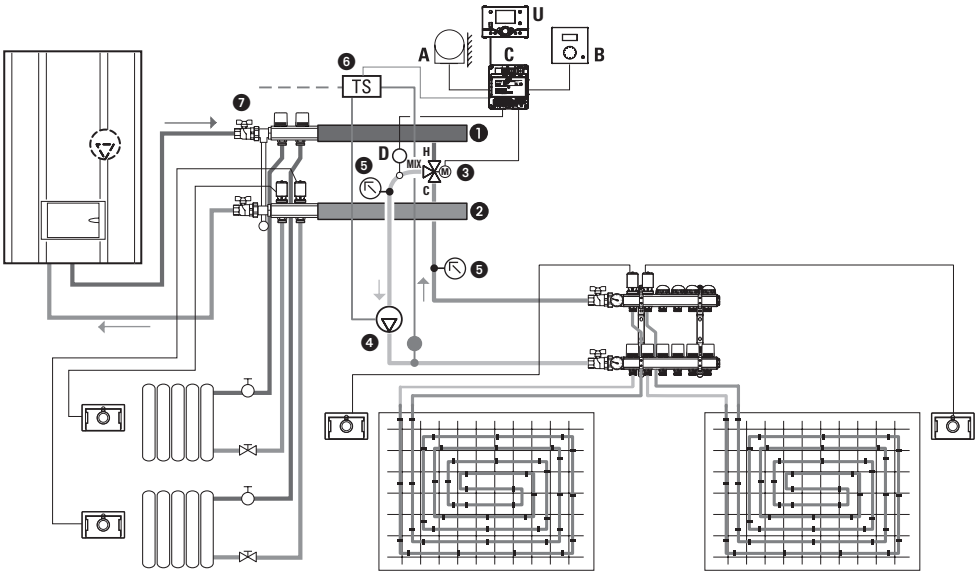


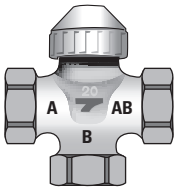
Fig. 4 - Modules for low-temperature heating system with auxiliary connections for high-temperature terminals

1. Flow bar
2. Return bar
3. 3-way mixer valve with electric servomotor
4. Shark circulator pump N 6/53 cabled
5. Control thermometers
6. Electrical box with safety thermostat for wiring of low temperature circulation pump
7. Progress valves kit (optional)

A External probe - **B** Remote control with room sensor - **C** Climatic adjustment device RC FH - **D** Flow pipe probe - **U** Control unit

2.1 Three-way mixer valve

Mixture takes place through ways **A** and **B** towards **AB.**



Way **AB** = total constant flow rate (outlet)
Way **A** = variable flow rate of the boiler (inlet)
Way **B** = variable flow rate of the bypass (inlet

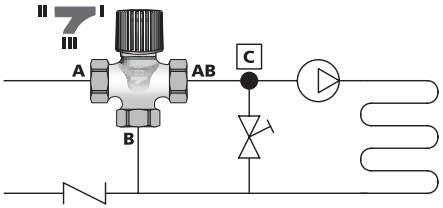
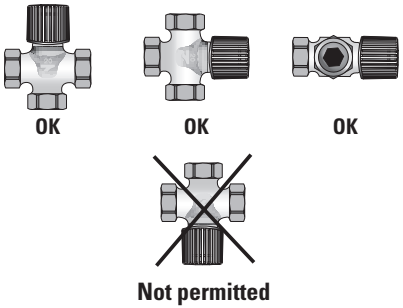


Fig. 5

Operation of the valve
To operate the valve, use the standard manual cap provided or a properly installed servo-control.
Rod upwards: straight way closed, angle way open.
Rod downwards: straight way open, angled way closed.

Assembly
Assembly of the valve and servo-motor is easy, since special tools or travel calibration are not required.
During installation, carefully note the **symbol of the direction of flow of the valve:**
Mixing from A/B to AB.

Positions

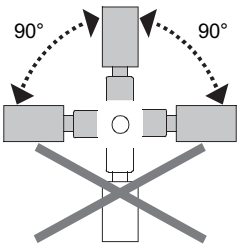


Only Floor Controlbox / First Box;
The mixing valve is in preassembled group.

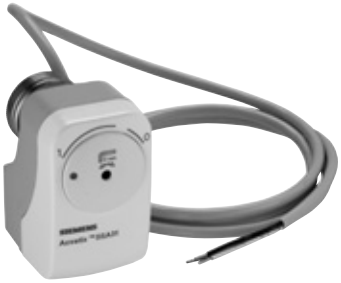
2.2 Servo-control

The servo-control (model SSY39) can be assembled only with mixer valves (see 2.1). The servo-control and the valve must be assembled muanuality (using the threaded coupling ring).

Installation positions



Only for Floor Control Unit / Firstbox
The servo-control has to be already mounted on the adjustment valve of the Floor Control Unit and on the mixer valve of the Firstbox. Electrical connections with adjuster must be made as in the diagram in chapter 2.11.



2.3 Flow sensor

The sensor is to be installed on the flow pipe of the system, down the line from the mixing node C (Fig.5, page 9) in the copper immersion well (not incluted). Fill the well with heat-conducting paste.

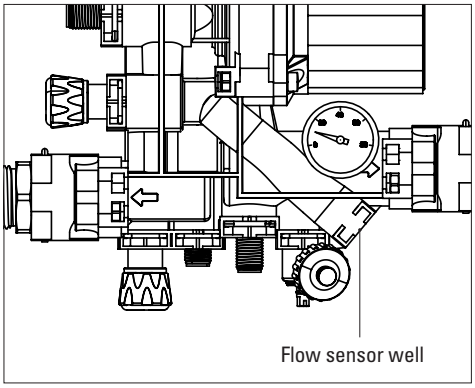
Only for Floor Control Unit / Firstbox:
The probe is to be installed in the immersion well of the Floor Control Unit and of the Firstbox as shown in point 2.4 and 2.5.

Electrical connections with adjuster are to be made as shown in the diagram in chapter 2.11.

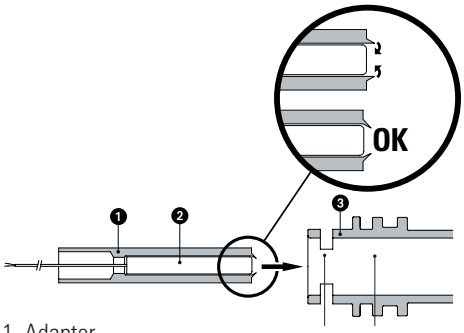
Attention!
The sensor must not be placed directly in the flow without the well.

2.4 Flow sensor on Floor Controlbox

The sensor must be installed in the appropriate well shown in the subsequent figure.



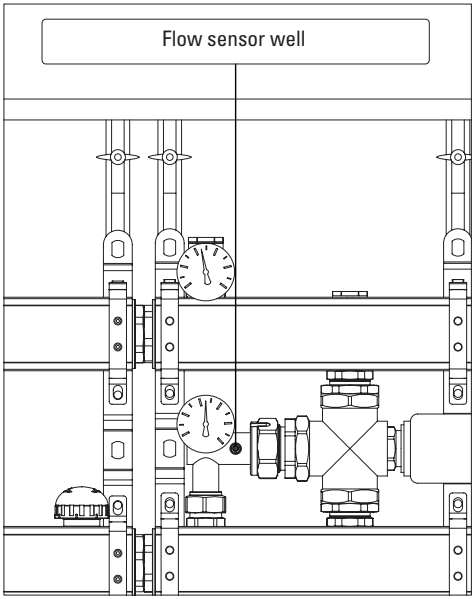
Proceed with installation using the brass adaptor as in the figure.



1. Adaptor
2. Sensor
3. Well

2.5 Flow sensor on Firstbox

The sensor must be installed in the appropriate well shown in the subsequent figure (after the installation has been completed the sensor can be blocked by gently deforming the well with a pair of pliers).



2.6 Safety thermostat

The safety thermostat must be installed on the flow pipes of the circuit, downstream from the mixing node **C** (Fig. 5 page 9).
Adjust the activation temperature of the thermostat to a value that ensures safety against damaging the floor (recommended 50 °C) For electric connections see diagramm 1- chapter 2.11.

Only for Floor Control Unit/ Firstbox
The electrical box with safety thermostat must be wired to the climatic adjuster and circulator pump of the group as shown in the diagram 2 in chapter 2.11.

2.7 External sensor

The sensor must be positioned as follows:
- On the coolest wall of the building (normally the one that faces north), never exposed to morning sunlight. If in doubt, install the sensor on the north or northwest side.

Height of installation:
- Preferably halfway up the building or on the zone to be heated, but at least 2.5 metres above the ground.

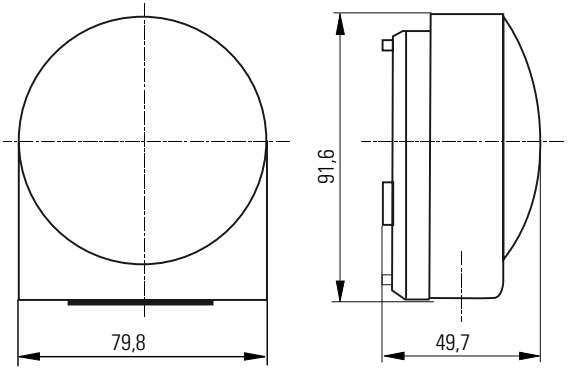
The sensor must **not** be installed:
- Above windows, doors, exhaust fans or other heat sources.
- Under balconies or gutters.

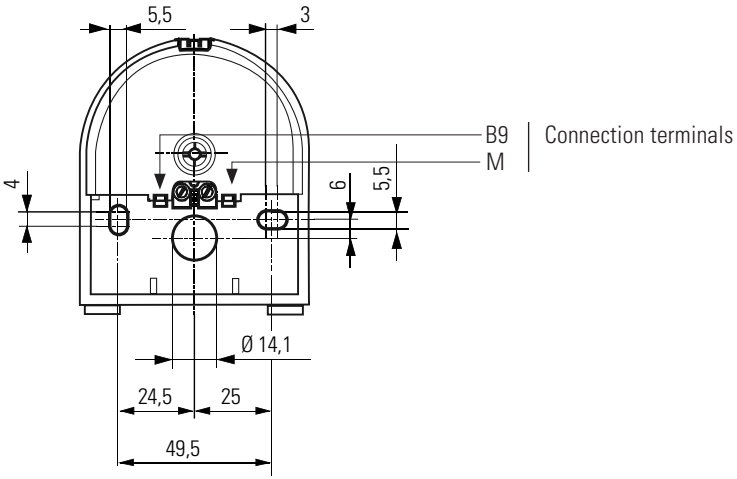
To prevent size mistakes, the hole in the wall that the cable passes through must be sealed. The sensor must not be painted.
Assembly instructions are printed on the packaging.

The length of the cables for connecting the sensors is the following:

Type of cable	Dimensions	Length
Copper cable	Diameter 0.6 mm	20 m
Copper cable	Cross section 1.0 mm^2	80 m
Copper cable	Cross section 1.5 mm^2	120 m

Dimensions and template for installation holes



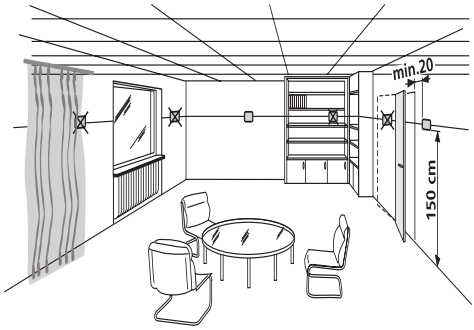


2.8 Room remote control

The remote control should by located in the most important room of the home.

The remote control must be installed on an inside wall or in a recessed junction box, in a position that is suitable for correct temperature measurement. You should avoid installation in niches, behind curtains, near sources of heat or cold, or in areas affected by sunlight.

When the electrical wires are placed in a chase, you will need to plug the tube that holds the wires to prevent air currents from affecting temperature measurement. Connection must be made using a cable of 2x0.5-mm^2 with a maximum length of 50 m.

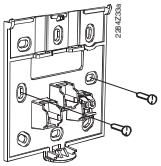


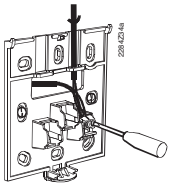
2.9 Climatic adjustment device RC FH

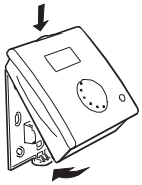
Rule for installation

- Air circulation must be ensured around the adjustment device, allowing the unit to dispose of the heat produced during operation. A free space of at least 10 mm must be provided above and below the adjustment device.
  This space must not be accessible and foreign objects must not be placed above it. Free space must also be ensured in front of the adjustment device.
- If the adjustment device is included in another thermally insulated device, a space of at least 100 mm must be left around the cooling fins.
- The adjustment device is designed in compliance with directives for safety class II.
- The power can be supplied to the adjustment device only after the unit has been completely installed. Failure to comply with this rule will lead to the risk of electrical chock near the terminals and through the cooling outlets.
- The adjustment device must not be exposed to dripping water.
- The admissible room temperature when it is installed and ready for operation is 0...50°C.

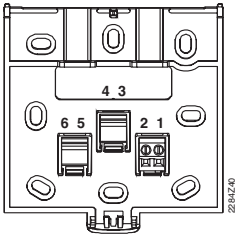
Method of installation of room remote control





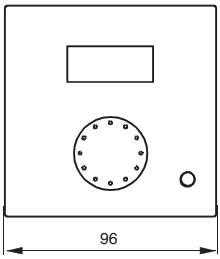


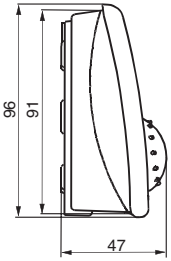
Connections

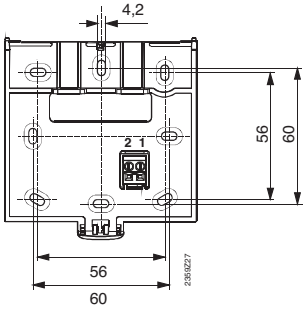


1	CL +	Data
2	CL -	Ground

Dimensions and template for installation holes

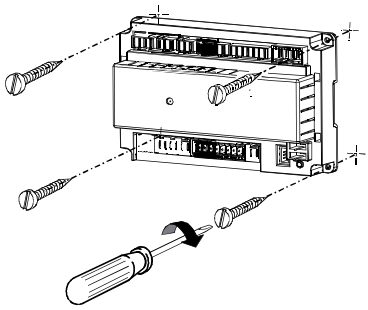




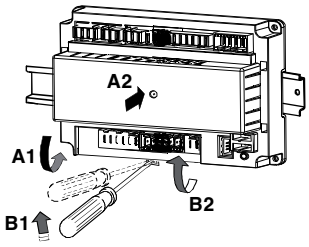


Method of installation of climatic adjustment device RC FH

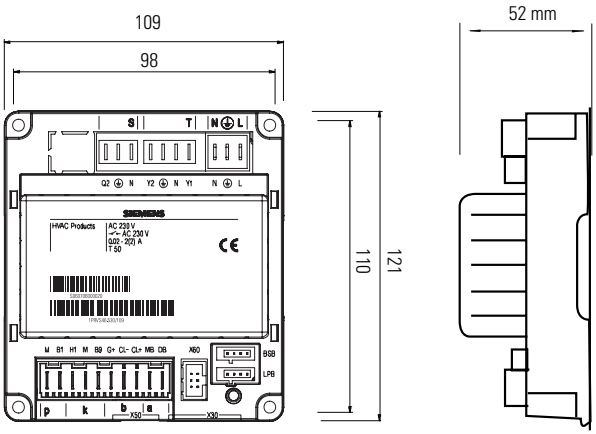
Fixing screw



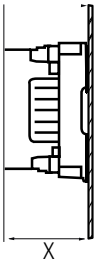
Fixing on stick DIN



Dimensions and template for installation holes



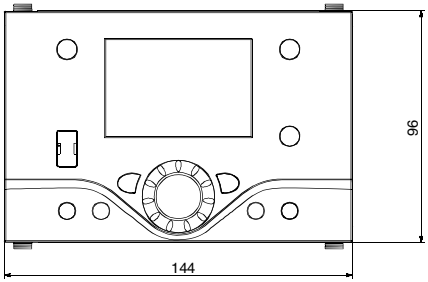
Free space in front



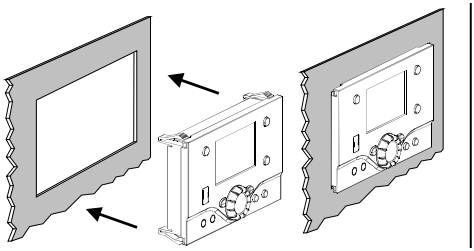
Dimension X:
For connectors with tab: minimum 70 mm
For connectors without tab: minimum 60 mm

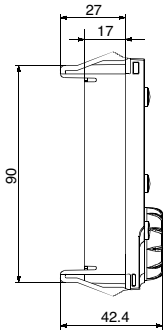
2.10 Control unit

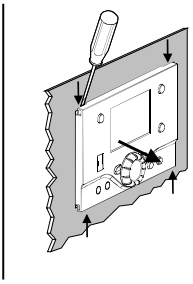
Dimensions:



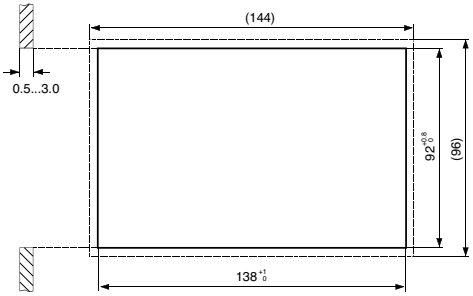
Method of installation







Template for drilling panel:



Connections:
The control unit is to be connected to terminal X30 of the adjustment device RC FH by means of the connection cable.

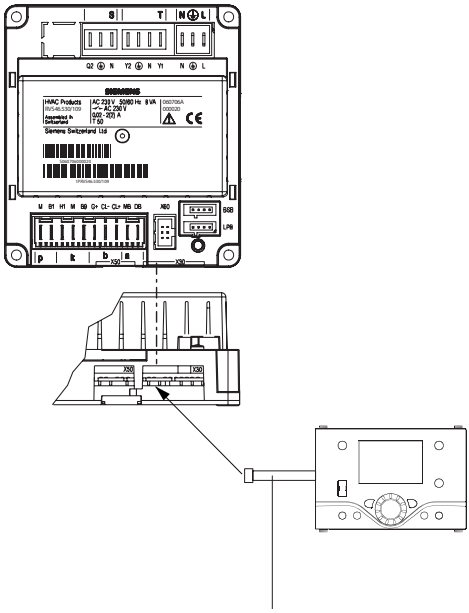
Attention: the maximum distance between the control unit and the adjustment device RCFH is constrained by the length of the connection cable (~ 1 m).

2.11 Wiring - general rules

- Before installing the adjustment device, disconnect the electrical power supply.
- The mains and low voltage connections are separate.
- Wiring must be carried out in compliance with safety class II.

This means that the cables of the sensors and those of the mains can not be placed in the same duct.

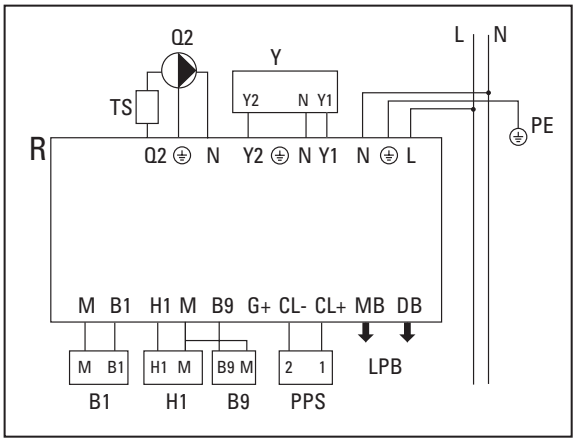
Connection terminals



High voltage side		
Terminal	Description	Connector
L ⏚ N	Phase AC 230 V Ground Neutral	N ⏚ L
N ⏚ Q2	Neutral Ground Heating circuit pump	S
Y1 N ⏚ Y2	Opening of mixing valve Neutral Ground Closing of mixing valve	T

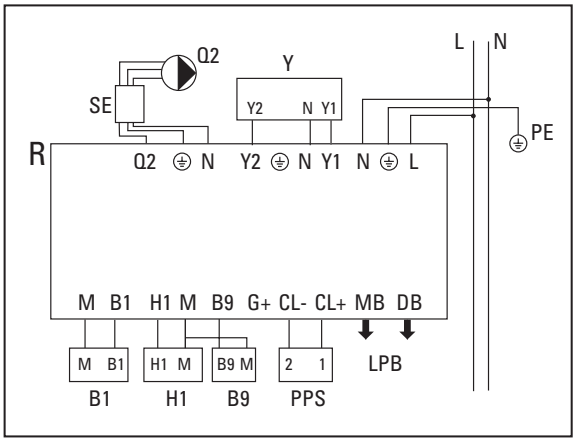
Low voltage side		
Terminal	Description	Connector
BSB LPB X60 X50 X30	Not used Not used Not used Not used Control unit	
DB MB	LPB data LPB earth	a
CL+ CL- G+	Room remote control unit Room remote control unit	b
B9 M H1	External sensor Ground Digital input / Dc 0...10V	k
B1 M	Flow sensor Ground	p

Diagram 1 - Kit for electronic climate control RC FH (with safety thermostat)



Key	
LPB*	Connection BUS
PPS	Room remote control
B9	External sensor
B1	Flow sensor
H1	Auxiliary control
Q2	Circulator pump
Y	3- position servo-control
TS	Safety thermostat
SE	Electrical box with safety thermostat
R	Climatic adjustment device
PE	Ground
* Optional	

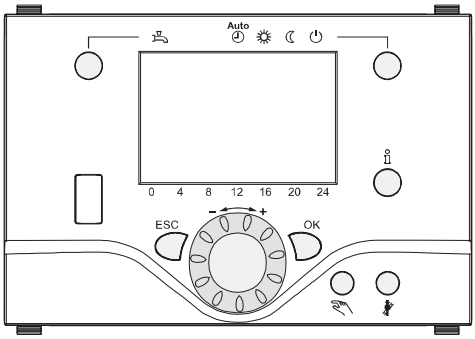
Diagram 2 - Kit for electronic climate control RC FH (with electrical box with safety thermostat for wiring of low temperature circulation pump)



Note:
The consent to the boiler can only be managed by a connection with Opentherm protocol. For boilers lacking Opentherm, the consent can be managed by connecting a relay in parallel with the circulation pump. See connection diagrams (Chapter 5).

3.1 Commissioning

3.1.1 Control unit



3.1.2 Getting started

To activate the adjustment device, follow this procedure:

1 Plumbing checks
- The cut-off valves of the manifold(s) must be open.
- The circuits of the floor system must be open. Any electro-thermal heads must be opened.
- Any over-pressure valves must be calibrated based on the characteristics of the circulator pump.

2 Electrical checks
Make sure that the installation of components and the wiring of the adjustment device comply with the instructions and the electrical diagrams.

3 Supply power to the adjustment device and follow these procedures:
- Language settings (see paragraph 3.1.3).
- Perform functional checks (see paragraph 3.1.4).
- Programme the adjustment device (see paragraph 3.1.4).
- On the adjustment device, set the comfort temperature with the appropriate knob and the automatic operating mode (*see paragraph 3.2).*

4 Set maximum flow temperature and safety thermostat (see paragraph 3.6.4 page 48).

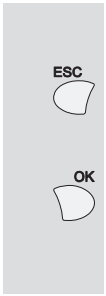
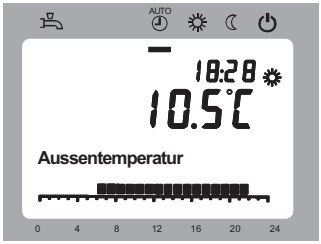
5 Adjust the design temperature difference and balance the flow rates using the stopper on the bypass branch see chapter *(paragraph 3.7 adjustment and balancing of system).*

6 Reset the alternate outdoor temperature (operating line 8703).

3.1.3 Language settings

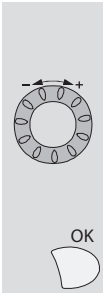
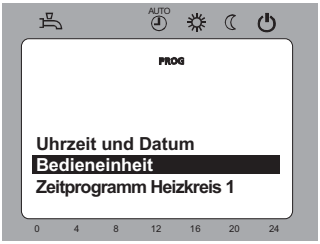
The default language is german. To select language do the following.

1

Operation	Display example
	

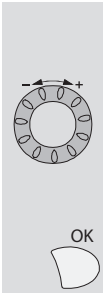
Basic display. You can see outdoor temperature (Aussentemperatur). If you do not see the basic display, press the ESC button.
Press the ESC button.

2

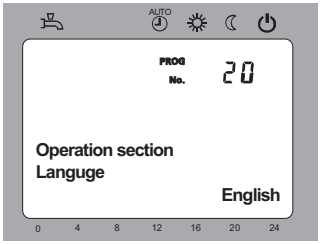
Operation	Display example
	

Turn the knob until the operating line "Bedieneinheit" is selected, then press the OK button.

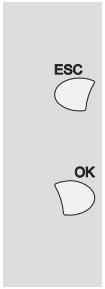
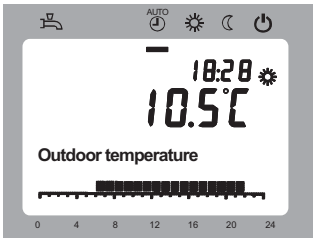
3

Operation	Display example
	
Operating line 20 is dislayed. Press OK button, setting language starts flashing. Turn the knob until the desired language is selected. Press the OK button to confirm.	

If you choose English the display shows:



4

Operation	Display example
	
Press ESC two times to go back to the initial display. This is now the actual display.	

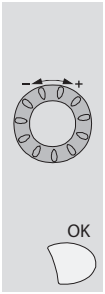
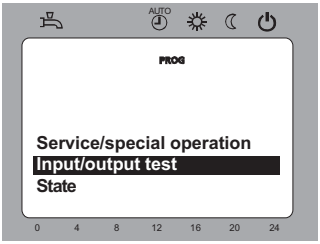
3.1.4 Functional checks

To facilitate commissioning and troubleshooting, the adjustment device allows testing on the inputs and outputs of the device itself.
The test is used to verify the proper functioning of the components connected to the device. **To access the test you must first enter the user level "Commissioning" (see paragraph 3.3.3 "User levels").**

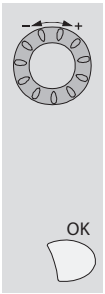
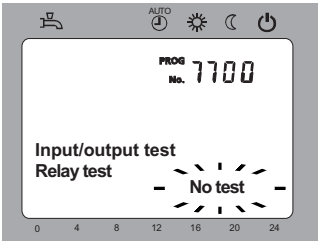
Relay test (output test)
By selecting one test the related relay is power supplied and the connected component is operated making possible the verification of proper wiring and operation.

1 Enter the user level "Commissioning" (see paragraph 3.3.3 (User levels).

2

Operation	Display example
	
Turn the knob until the operating line "Input/output test" is selected, then press the OK button to confirm.	

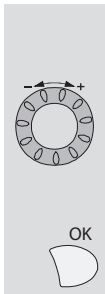
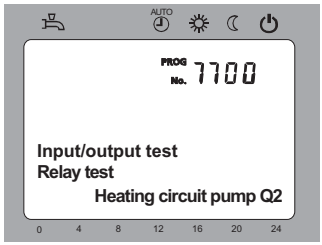
3

Operation	Display example
	
The operating line 7700 will be displayed. By pressing OK, the type of test that can be selected will start to flash (e.g., in the figure, "No test"). To move around in the TEST list, turn the knob until the test flashes.	

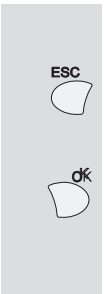
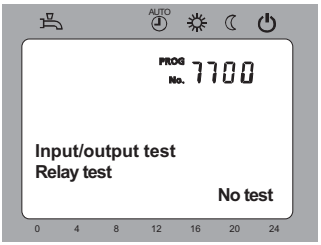
In particular, is possible to run the following test

NO TEST	All outputs perform their actions of changeover in compliance with normal control operations.
ALL OFF	All outputs are deactivated.
PUMP CR Q_2	The circulator pump Q2 is activated
VALVE MIX CR OPEN Y1	Mixer valve in opening Y1 is activated
VALVE MIX CR OPEN Y2	Mixer valve in closing Y2 is activated

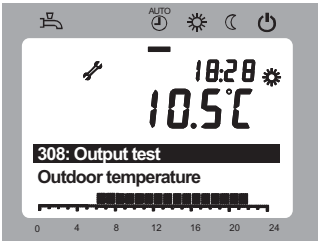
4

Operation	Display example
	
Confirm the selected test by pressing OK button (in the example "Heating circuit pump Q2" : the circuator pump will be power supplied).	

5

Operation	Display example
	
To stop relay test you must select "No test" and then confirm by pressing OK button. Press ESC two times in order to return to the basic display.	

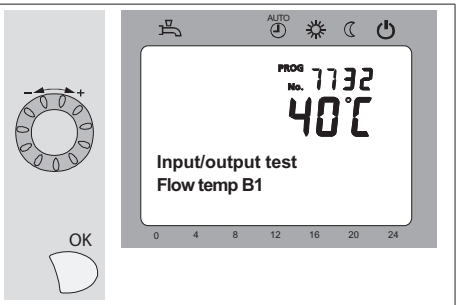
Caution! If the "No test" command is not selected, even if the ESC key is pressed repeatedly, the regulator will remain blocked on line 308: Outputs test and the "Maintenance" mode symbol will be shown on the display.



To exit from this mode, it will be necessary to repeat the operations from step 1 to step 3 and select the "No test" test, confirming with OK.

Input test

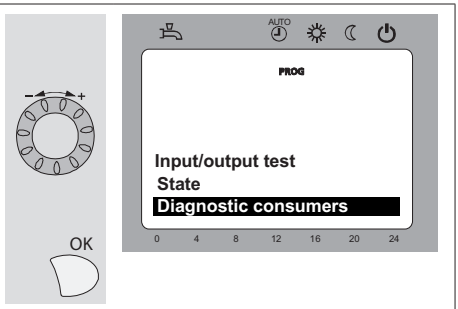
It allows to verify the proper functioning of the device inputs.
Repeat relay test points 1 and 2.
By turning the knob is possible to display the operating lines related to the device inputs.
In particular is possible to display:



- Outdoor temperature (operating line 7730);
- Flow temperature (operating line 7732): see picture;
- Contact H1 state: open or closed (operating line 7841)

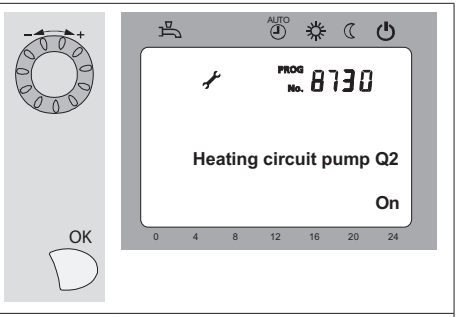
Diagnostic consumers

It is possible to check some parameters for a detailed diagnosis of the system.



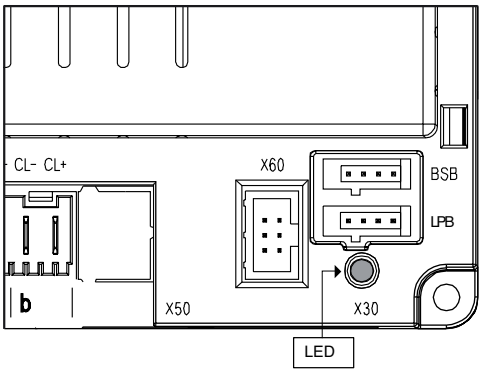
Enter the user level "Commissioning".
Turn the knob and select operating line "Diagnostic consumers".

The display shows some parameters and in particular:



- outdoor temperature (operating line 8700);
- circuit pump state - on/off - (operating line 8730);
- mixer valve state - open/closed (operating line 8731 and 8732);
- room temperature (if remote control with room sensor is connected) and room setpoint (operating line 8740);
- flow temperature and flow setpoint (operating line 8743);

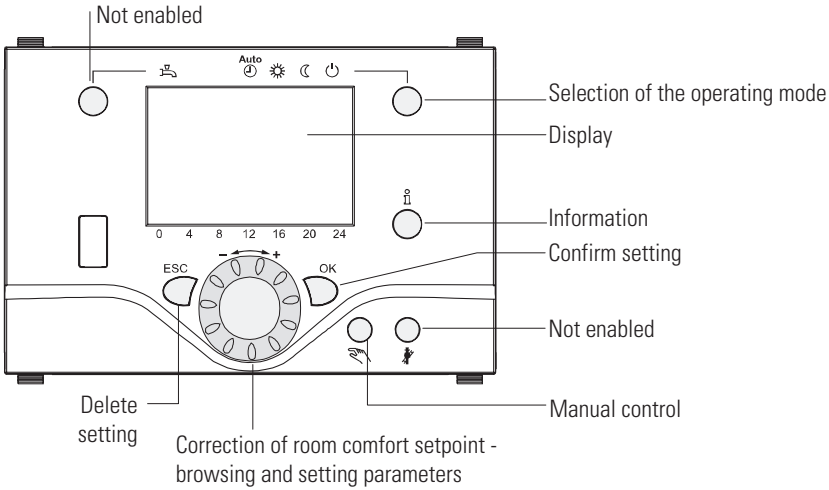
Check of LED of climatic adjustment device



LED off:	no power
LED on:	ready for operation
LED flashing:	failure signal

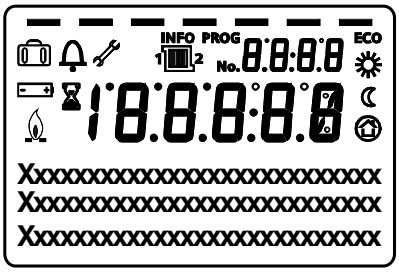
3.2 Methods of use

3.2.1 Instructions for use Control unit



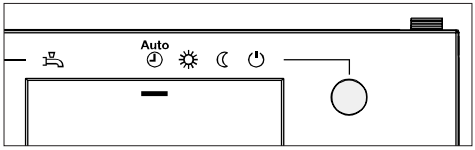
	Heating to comfort setpoint
	Heating to reduced setpoint
	Heating to anti-freeze protection setpoint
	Working - please wait
	Battery replacement
	Burner in operation (only oil/gas burner)
INFO	Info level active
PROG	Programming active
ECO	Heating system temporarily off ECO functions active
	Holiday function active
1 2	Reference to heating circuit no active
	Special/maintenance mode
	Error messages

Display of available symbols



Selection of the heating mode

Press the button to select the various heating modes. The selected mode is indicated by a bar beneath the corresponding symbol.



Automatic operation. **Auto**

Automatic operation controls the room temperature based on the set hourly programme.
Characteristics of automatic operation:
– Heating mode based on hourly programme.
– Temperature setpoint based on the programme "Comfort setpoint" ☼ or "Reduced setpoint" ☾
– Protection functions active.
– Automatic summer/winter changeover (ECO functions).

Continuous operation ☼ or ☾

Continuous operation keeps the ambient temperature at the selected level.

☼ Heating to comfort setpoint
☾ Heating to reduced setpoint

Characteristics of continuous operation:
– Heating without hourly programme.
– Protection functions active.
– Automatic summer/winter changeover (ECO functions) and 24 hour limit of heating non-active, for continuous operation with comfort setpoint.

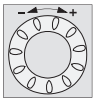
Standby mode ⏻

When using standby mode, the heating system is not active, but the anti-freeze functions are active.

Standby mode characteristics
– Heating off.
– Temperature according to anti-freeze protection.
– Protection functions active.
– Automatic summer/winter changeover (ECO functions) and 24 hour limit of heating active.

Correction of the ambient temperature set point

For the **comfort** setpoint ☼ turn the knob and confirm with OK During active operation of heating, the heating comfort setpoint is modified.



For the **reduced** setpoint ☾
– Press the OK button if your are in the basic display; otherwise first press ESC.
– Select the page "Heating circuit 1" using the knob and the OK key, then select "Reduced setpoint" (operating line 712).
– Press the OK button. The displayed value starts flashing. Turn the knob to modify the value then confirm with the OK button.

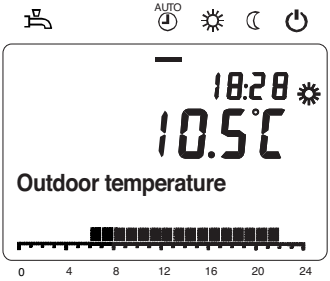
Note: After each correction, wait at least 2 hours to allow the requested room temperature to be reached.

Note: For a floor heating plant is better that ΔT between comfort setpoint and reduced setpoint does not exceed 2 °C.

Es. Comfort setpoint 20 °C - Reduced setpoint 18 °C

Display of information

The info button is used to display information.



If you press the info key several times, or if you press it once and turn the knob, you can display:

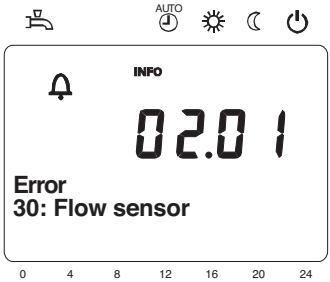
– Outdoor temperature
– Minimum outdoor temperature
– Maximum outdoor temperature
– Heating circuit status
– Hour/date
– Customer service telephone

In special cases, the display shows one of the following symbols:

Error messages

When this symbol appears, a system error has appeared. In this case, press the Info button for more information.

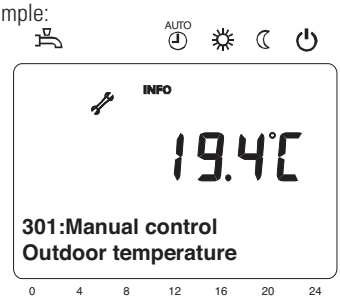
Example:



Special or maintenance mode

When this symbol appears, a maintenance alarm has occurred or the system has gone into special mode. Press the Info button for more information.

Example:



See the list of codes in paragraph 3.6.12

Manual control

The manual operation is an operating mode in which the necessary components of the system must be adjusted and monitored manually. The functions of the regulator have no effect on the relays.
This can be used as an emergency function in case the regulator or servocontrol of the mixer valve malfunctions.

Setting:

Activation: The manual control is activated by pressing this button.

Deactivation: By pressing the manual control button again.

Note

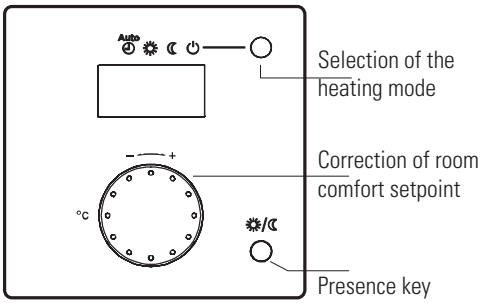
When this function is deactivated, the regulator will automatically return to the previously selected operating condition.

The outputs will pass to the following states:

Output	Terminal	State
Circulation pump	Q2	ON
Mixer valve	Y1 / Y2	OFF

3.2.2 Instructions for use of room remote control

Operating elements

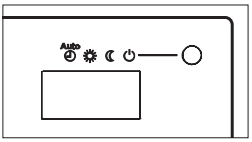


Information on display	
☼	Heating to comfort setpoint
☾	Heating to reduced setpoint
🔥	Burner in operation (only for fuel oil/gas burners)
🔔	Error/maintenance messages

Display of available symbols

Basic display

Selection of the heating mode



Press the button to select the various heating modes. The selected mode is indicated by a bar beneath the corresponding symbol.

Automatic operation. Auto

Automatic operation controls the room temperature based on the set hourly programme.
Characteristics of automatic operation:
– Heating mode based on hourly programme.
– Temperature setpoint based on the programme "Comfort setpoint" ☼ or "Reduced setpoint" ☾
– Protection functions active.
– Automatic summer/winter changeover (ECO functions).

Continuous operation ☼ or ☾

Continuous operation keeps the ambient temperature at the selected level.

☼ Heating to comfort setpoint
☾ Heating to reduced setpoint

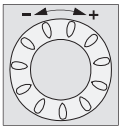
Characteristics of continuous operation:
– Heating without hourly programme.
– Protection functions active.
– Automatic summer/winter changeover (ECO functions) and 24 hour limit of heating non-active, for continuous operation with comfort setpoint.

Standby mode ⏻

When using standby mode, the heating system is not active, but the anti-freeze protections are ensured (anti-freeze protection temperature).
Protection mode characteristics:
– Heating off.
– Temperature according to anti-freeze protection.
– Protection functions active.
– Automatic summer/winter changeover (ECO functions) and 24 hour limit of heating active

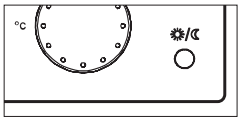
Correction of the ambient temperature set point

The setpoint is set based on the heating mode.
Turn the knob to increase or decrease the comfort setpoint. Confirm the setting using the text for selection of the heating mode.
NB: After each correction, wait at least two hours to allow the requested room temperature to be reached.



Presence key ☼/☾

When the rooms are not occupied for a certain length of time, you can go to the heating to reduced setpoint mode by pressing the presence key.
Press the presence key to go back to the previously set operating mode.



– The presence key can be activated only in automatic mode.
– The setting remains active until next time of heating established by the programme.

3.3 Programming

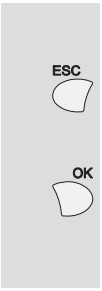
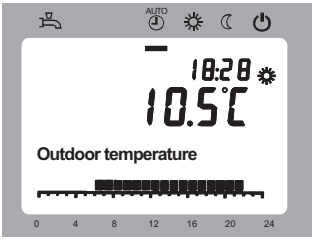
Main setting
The settings that cannot be made directly are managed through programming.
The parameters are structured in pages and operating lines and are divided in groups.

3.3.1 General Rules

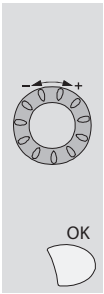
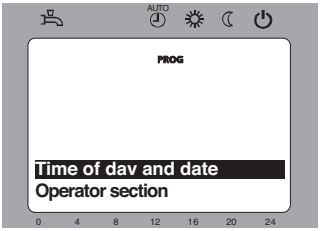
– Press the button ESC to return to the previous parameter without memorizing the modified value.
– If no new parameters are set for 8 minutes, the device automatically returns to the previous display.
– Some operating lines may be hidden. This may depend on the type of device used, its configuration, and the user access level.

3.3.1 Setting date and time

1

Operation	Display example
	
Basic display If you do not see the basic display, press the ESC button. Press the OK button	

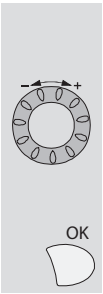
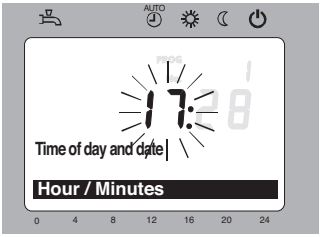
2

Operation	Display example
	

The lower part of the display shown a number of operating pages. Turn the knob until the operating page "Time and date" is selected.

Press the OK button to confirm.

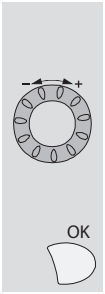
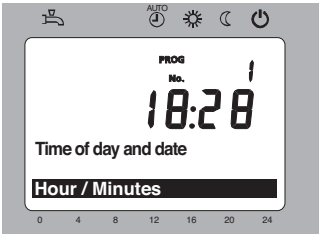
4

Operation	Display example
	

The display shows the hour flashing. Turn the knob to set the correct time.

Press the OK button to confirm.

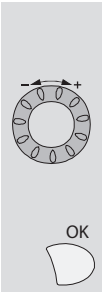
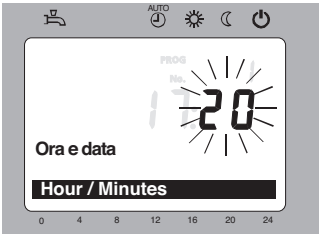
3

Operation	Display example
	

The lower section of the display shown the first operating line of the page "Time and Date". Turn the knob until you see the operating line "Hours/ minutes".

Press the OK button to confirm.

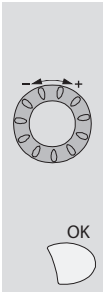
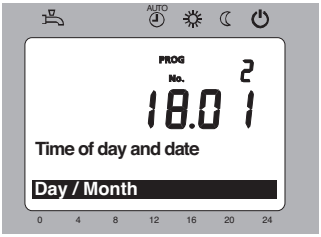
5

Operation	Display example
	

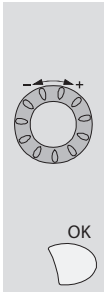
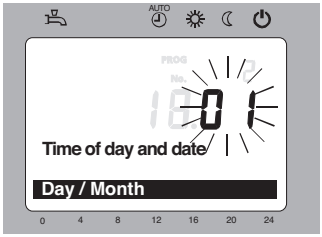
The display shows the minutes flashing. Turn the knob to set the minutes to the correct time.

Press the OK button to confirm.

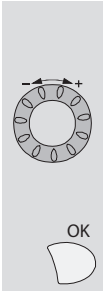
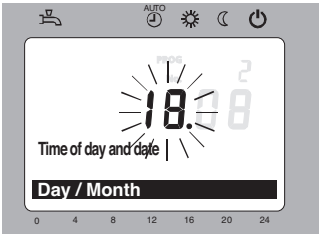
6

Operation	Display example
	
To set the date turn the knob until the operating line "Day/Month" is selected Press the OK button to confirm.	

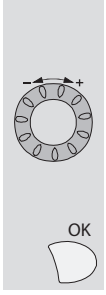
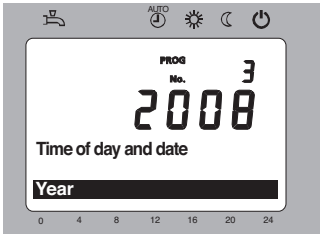
7

Operation	Display example
	
The display shows the month flashing. Turn the knob to set the correct month. Press the OK button to confirm.	

8

Operation	Display example
	
The display shows the day flashing. Turn the knob to set the correct day. Press the OK button to confirm. The date is set.	

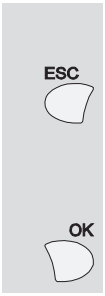
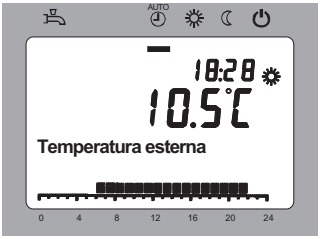
9

Operation	Display example
	
To set the year turn the knob until the operating line "Year" is selected Press the OK button and turn the knob. When the current year is selectioned press the OK button to confirm. The year is set.	

3.3.3 User levels (Enduser, Commissioning, Engineer)

Each user level allows access to a specific group of parameters.
To access each user level, proceed as follows:

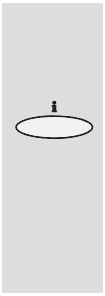
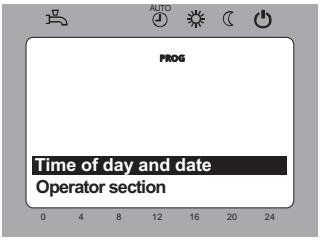
1

Operation	Display example
	

Basic display If you are not at the basic display, press ESC.

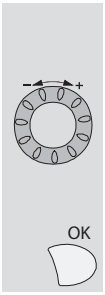
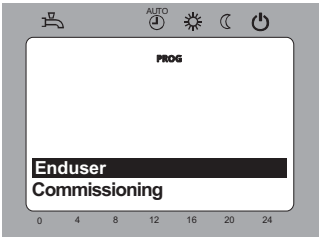
Press the OK button

2

Operation	Display example
	

User level: final user
Press the Info key for 3 seconds

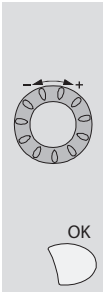
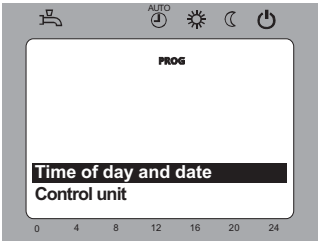
3

Operation	Display example
	

The list of user levels is shown.
Turn the knob to show the desired user level.

Press the OK button

4

Operation	Display example
	

The groups of parameters are displayed which can be accessed in the requested user level.

3.4 Programming of heating hours

It is possible to enter in the operating lines described in this section by pressing the OK button (if you are at the basic display) and by selecting operating pages "Time program heating circuit 1", "Holidays HC1" and "Heating circuit 1.
The adjustment device lets you programme, for each day of the week three periods of comfort temperature (heating) operating lines 501, 503, 505 (also see paragraph 3.6.3) and of reduced temperature (end of heating) operating lines 502, 504, 506.
The established heating periods are activated only in automatic heating mode.
During heating periods, the working setpoint is the one set in operating line 710 (comfort setpoint).
In end of heating periods, it is set in operating line 712 (reduced setpoint).

Note:
You can reset the values to their default settings (operating line 516).

Pre-selection of day of week (operating line 500)

Important
This setting must be made before you insert the heating periods

The heating periods can be selected in combined mode, common to several days (Mo-Su, Mo- Fr, Sa-Su).
You can also select individual days of the week (Mo, Tu, We, Th, Fr, Sa, Su)

In the first case, entering heating periods is the same for each day from Monday to Sunday (Mo-Su), from Monday to Friday (Mo-Fr), from Saturday to Sunday (Sa- Su).
In the second case it is possible to set different heating periods for each day of the week.

Holiday programmme

The holiday programme lets you programme, for one year, the operation of the adjustment device for periods when you will be away from home.
You can programme up to 8 holiday periods (operating lines 642, 643).

During these periods, operation will be changed over to the set mode (operation at reduced setpoint or operation at anti-freeze protection setpoint - operating line 648).
Holiday periods are activated only if automatic heating mode is selected.
In other operating modes, these periods are activated in background and become operational when you change over to automatic mode.
When a holiday period is over, the adjustment device cancels it.
If you want the same period to be activated the following year, you must re-programme it.
You can exit an activated holiday period either by going to an operating mode other than automatic (heating mode selection key) or by deleting that holiday period from programming.

3.5 Display of parameters

The table shows all of the parameters that can be accessed by the final user, the commissioning technician, and the installer.
U = Enduser
M = Commissioning
S = Engineer
NB: You should only modify the parameters in bold

Operating line	User level	Function	Default values	Minimum	Maximum	Unit of measure
Time and date						
1	UMS	Hours / minutes	-	00:00	23:59	hh:mm
2	UMS	Month, day	-	01.01	31.12	dd.MM
3	UMS	Year		2004	2099	yyyy
5	S	Start of summer time	25.03	01.01	31.12	dd.MM
6	S	End of summer time	25.10	01.01	31.12	dd.MM
Operator section						
20	UMS	Language German ¦....	German			-
22	S	Info Temporarly¦ Permanently	Temporarly			-
26	S	Control lock Off ¦ On	Off			-
27	S	Programming lock Off ¦ On	Off			-
28	MS	Direct adjustment Automatic storage ¦ Storage with confirmation	Storage with confirmation			-
44	MS	Operation HC2 **NOT USED** Commonly with HC1 ¦ Independently	Commonly with HC1			-
46	MS	HCP pump operation **NOT USED** Commonly with HC1 ¦ Independently	Commonly with HC1			-
70	S	Software release	-			-

Operating line	User level	Function	Default values	Minimum	Maximum	Unit of measure
Time program heating circuit 1						
500	UMS	Pre-selection Mo - Su ¦ Mo - Fr ¦ Sa - Su ¦ Mo ¦ Tu ¦ We ¦ Th ¦ Fr ¦ Sa ¦Su	Mo - Su			-
501	UMS	1st period on	6:00	00:00	24:00	hh:mm
502	UMS	1st period off	22:00	00:00	24:00	hh:mm
503	UMS	2nd period on	24:00	00:00	24:00	hh:mm
504	UMS	2nd period off	24:00	00:00	24:00	hh:mm
505	UMS	3rd period on	24:00	00:00	24:00	hh:mm
506	UMS	3rd period off	24:00	00:00	24:00	hh:mm
516	UMS	Default values No ¦ Yes	No			-
Time program heating circuit 5						
600	UMS	Pre-selection - **NOT USED** Mo - Su ¦ - Mo - Fr ¦ Sa - Su ¦ Mo ¦ Tu ¦ We ¦ Th ¦ Fr ¦ Sa ¦Su	Mo - Su			-
601	UMS	1st period on - **NOT USED**	6:00	00:00	24:00	hh:mm
602	UMS	1st period off - **NOT USED**	22:00	00:00	24:00	hh:mm
603	UMS	2nd period on - **NOT USED**	24:00	00:00	24:00	hh:mm
604	UMS	2nd period off - **NOT USED**	24:00	00:00	24:00	hh:mm
605	UMS	3rd period on - **NOT USED**	24:00	00:00	24:00	hh:mm
606	UMS	3rd period off - **NOT USED**	24:00	00:00	24:00	hh:mm
616	UMS	Deafault values - **NOT USED** No ¦ Yes	No			-

Operating line	User level	Function	Default values	Minimum	Maximum	Unit of measure
Holidays HC1						
641	UMS	Pre-selection Period 1 ¦ Period 2 ¦ Period 3 ¦ Period 4 ¦ Period 5 ¦ Period 6 ¦ Period 6 ¦ Period 8	Period 1			-
642	UMS	Start	-- --	01.01	31.12	dd.MM
643	UMS	End	-- --	01.01	31.12	dd.MM
648	UMS	Operating level Frost protection ¦ Reduced	Frost protection			-
Heating circuit 1						
710	UMS	Comfort setpoint	20	Op. line 712	Op. line 716	°C
712	UMS	Reduced setpoint	16	Op. line 714	Op. line 710	°C
714	UMS	Frost protection setpoint	10	4	Op. line 712	°C
716	S	Comfort setpoint max	35	Op. line 710	35	°C
720	UMS	Heating curve slope	1.5	0.1	4	-
721	S	Heating curve displacement	0	-4,5	4.5	°C
726	S	Heating curve adaption Off ¦ On	Off			-
730	UMS	Limit of summer/winter changeover	18	– – – / 8	30	°C
732	MS	24 hour heating limit	-3	– – – / -10	10	°C
740	MS	Min. flow temperature setpoint	8	8	Op. line 741	°C
741	MS	Max. flow temperature setpoint	80	Op. line 740	95	°C
750	S	Room influence	20	– – – / 1	100	%
760	S	Room temperature limit	1	– – – / 0.5	4	°C
770	S	Boost heating	5	– – – / 0	20	°C
780	S	Quick setback Off ¦ Down to reduced setpoint ¦ Down to frost protection	Down to reduced setpoint			-
790	S	Optimum start control max	0	0	360	min

Operating line	User level	Function	Default values	Minimum	Maximum	Unit of measure
Holidays HC1						
791	S	Optimum stop control max	0	0	360	min
800	S	Reduced setpoint increase start	– – –	– – – / -30	10	°C
801	S	Reduced setpoint increase end	-15	-30	Op. line 800	°C
820	S	Overtemperature protection circuit pump Off ¦ On	On			-
830	S	Mixing valve boost	5	0	50	°C
832	S	Actuator type 2-position ¦ 3-position	3 - position			-
833	S	Switching differential 2-position	2	0	20	°C
834	S	Actuator running time	120	30	873	S
850	MS	Floor curing function Off ¦ Functional heating¦ Curing heating ¦ Functional/Curing heating¦ Manually	Off			-
851	MS	Floor curing setpoint manually	25	0	95	°C
861	S	Excess heat draw Off ¦ Heating mode ¦ Always	Always			-
870	S	With buffer No ¦ Yes	Yes			-
872	S	With primary controller/system pump No ¦ Yes	Yes			-
900	S	Operating mode changeover None ¦ Protection ¦ Reduced ¦ Comfort ¦ Automatic	Protection			**-**
Configuration						
5710	MS	Heating circuit 1 Off ¦ On	On			-
5711	MS	Cooling circuit 1 off ¦ 4-pipe system ¦ 2-pipe system **NOT USED**	Off			-
5712	MS	Use of mixing valve 1 Heating ¦ Cooling ¦ Heating and cooling **NOT USED**	Heating and cooling			-
5715	MS	Heating circuit 2 Off ¦ On **NOT USED**	Off			-

Operating line	User level	Function	Default values	Minimum	Maximum	Unit of measure
Holidays HC1						
5950	MS	Input H1 function **NOT USED** Optg mode changeover HCs+DHW ¦ Optg mode changeover HCs ¦ Optg mode changeover HC1 ¦ Optg mode changeover HC2 ¦ Optg mode changeover HCP ¦ Error/alarm message ¦ Flow minimum setpoint ¦ Excess heat discharge ¦ Dewpoint monitor ¦ Flow temp setpoint increase hygro ¦ Refrigeration request ¦ Heat request ¦ Refrigeration request 10V ¦ Pressure measurement 10V ¦ Relative humidity 10V ¦ Room temperature 10V	Optg mode changeover HCs+DHW			-
5951	MS	Contact type H1 NC (normally closed) ¦ NO (normally open)	NO			-
5952	MS	Function value contact H1 **NOT USED**	70	8	130	°C
5953	MS	Voltage value 1 H1 **NOT USED**	0	0	10	Volt
5954	MS	Function value 1 H1 **NOT USED**	0	-100	500	-
5955	MS	Voltage value 2 H1 **NOT USED**	10	0	10	Volt
5956	MS	Function value 2 H1 **NOT USED**	70	-100	500	-
6014	MS	Function mixing Group 1 Heating circuit 1¦ Primary controller/system pump¦ Cooling circuit 1 ¦ Heating /cooling circuit 1	Heating circuit			-
6020	MS	Function expansion module 1 **NOT USED** None ¦ Multifunctional ¦ Heating circuit 1 ¦ Primary controller/system pump ¦ Cooling circuit 1 ¦	No function			-
6021	MS	Function expansion module 2 **NOT USED** None ¦ Multifunctional ¦ Heating circuit 2 ¦ Primary controller/system pump ¦ Cooling circuit 2 ¦	No function			-

Operating line	User level	Function	Default values	Minimum	Maximum	Unit of measure
Holidays HC1						
6030	MS	Output relay QX21 **NOT USED** None ¦ Pump H1 Q15 ¦ Alarm output K10 ¦ Speed second pump HC1 Q21 ¦ Speed second pump HC2 Q22 ¦ Speed second pump HCP Q23 ¦ Heat circuit pump HCP Q20 ¦ Pump H2 Q18 ¦ System pump Q14 ¦ Hourly programme 5 K13 ¦ Heat request K27 ¦ Cold request K28 ¦ Air dehumidifier K29 ¦ Cooling diverting valve Y21	None			-
6031	MS	Output relay QX22 **NOT USED** None ¦ Pump H1 Q15 ¦ Alarm output K10 ¦ Speed second pump HC1 Q21 ¦ Speed second pump HC2 Q22 ¦ Speed second pump HCP Q23 ¦ Heat circuit pump HCP Q20 ¦ Pump H2 Q18 ¦ System pump Q14 ¦ Hourly programme 5 K13 ¦ Heat request K27 ¦ Cold request K28 ¦ Air dehumidifier K29 ¦ Cooling diverting valve Y21	None			-
6032	MS	Output relay QX23 **NOT USED** None ¦ Pump H1 Q15 ¦ Alarm output K10 ¦ Speed second pump HC1 Q21 ¦ Speed second pump HC2 Q22 ¦ Speed second pump HCP Q23 ¦ Heat circuit pump HCP Q20 ¦ Pump H2 Q18 ¦ System pump Q14 ¦ Hourly programme 5 K13 ¦ Heat request K27 ¦ Cold request K28 ¦ Air dehumidifier K29 ¦ Cooling diverting valve Y21	None			-
6046	MS	Input H2 function **NOT USED** Optg mode changeover HCs+DHW ¦ Optg mode changeover HCs ¦ Optg mode changeover HC1 ¦ Optg mode changeover HC2 ¦ Optg mode changeover HCP ¦ Error/alarm message ¦ Flow minimum setpoint ¦ Excess heat discharge ¦ Dewpoint monitor ¦ Flow temp setpoint increase hygro ¦ Refrigeration request ¦ Heat request ¦ Refrigeration request 10V ¦ Pressure measurement 10V ¦ Relative humidity 10V ¦ Room temperature 10V	Optg mode changeover HCs+DHW			-
6047	MS	Contact type H2 **NOT USED** NC (normally closed) ¦ NO (normally open)	NO			-
6048	MS	Function value contact H2 **NOT USED**	70	8	130	°C

Operating line	User level	Function	Default values	Minimum	Maximum	Unit of measure
6049	MS	Voltage value 1 H2 **NOT USED**	0	0	10	Volt
6050	MS	Function value 1 H2 **NOT USED**	0	-100	500	-
6051	MS	Voltage level 2 H2 **NOT USED**	10	0	10	Volt
6052	MS	Function value 2 H2 **NOT USED**	70	-100	500	-
6100	S	Readjustment outdoor sensor	0	-3.0	3.0	°C
6110	S	Building time constant	15	0	50	h
6120	S	Frost protecion plant Off ¦ On	Off			-
6128	S	Heat request below outdoor T	– – –	– – – / -50	50	°C
6129	S	Heat request above outdoor T	– – –	– – – / -50	50	°C
6135	S	Dehumidifier **NOT USED** Off ¦ On	Off			-
6136	S	Dehumidifier release **NOT USED** 24h/Day ¦ Time program HC¦ Time program 5	24h/Day			-
6137	S	Dehumidifier R.H. ON **NOT USED**	55	0	100	%
6138	S	Dehumidifier R.H. OFF **NOT USED**	5	2	50	%
6200	MS	Save sensor No ¦ Yes	No			-
6205	S	Reset to default parameters No ¦ Yes	No			-
6215	MS	Check no. storage tank **NOT USED**	-	0	199999	-
6217	T	Check no. heating circuits **NOT USED**	-	0	199999	-
6220	S	Software version	-	0	99.9	-

Operating line	User level	Function	Default values	Minimum	Maximum	Unit of measure
System LPB						
6600	MS	Device address	1	0	16	-
6601	S	Segment address	0	0	14	-
6604	S	Power supply bus function Off ¦ Automatic	Auto-matic			-
6605	S	Power supply bus status Off ¦ On	On			-
6620	S	Action changeover functions Segment ¦ System	System			-
6621	S	Summer changeover Locally ¦ Centrally	Local			-
6623	S	Optg mode changeover Local ¦ Central	Unit			-
6625	S	Domestic hot water assignment **NOT USED** HCs local ¦ All HCs in segment ¦ All HCs in system	All HCs in system			-
6627	S	Refrigeration request **NOT USED** Local ¦ Central	Local			-
6640	MS	Clock mode Autonomous ¦ Slave without mode¦ Slave with remote setting¦ Master	Autono-mous			-
6650	S	Outdoor temperature source	-	-	-	-
Error						
6710	MS	Reset alarm relay No ¦ Yes	No			-
6740	S	Flow temperature alarm 1	– – –	– – – /10	240	min
6741	S	Flow temperature alarm 2 **NOT USED**	– – –	– – – /10	240	min
6746	S	Flow temperature alarm Cooling 1	– – –	– – – /10	240	min

Operating line	User level	Function	Default values	Minimum	Maximum	Unit of measure
6800	S	History 1	-			
	S	Error code 1	-	0	255	-
6802	S	History 2	-			
	S	Error code 2	-	0	255	-
6804	S	History 3	-			
	S	Error code 3	-	0	255	-
6806	S	History 4	-			
	S	Error code 4	-	0	255	-
6808	S	History 5	-			
	S	Error code 5	-	0	255	-
6810	S	History 6	-			
	S	Error code 6	-	0	255	-
6812	S	History 7	-			
	S	Error code 7	-	0	255	-
6814	S	History 8	-			
	S	Error code 8	-	0	255	-
6816	S	History 9	-			
	S	Error code 9	-	0	255	-
6818	S	History 10	-			
	S	Error code 10	-	0	255	-

OperatSng lSne	User level	FunctSon	Default values	MSnSmum	MaxSmum	UnSt of measure
ServSce/specSal operatSon						
7044	S	Maintenance interval	– – –	– – – / 1	240	Months
7045	S	Time since mainteinance	0	0	240	Months
7140	UMS	Manual operation Off ¦ On	Off			-
7150	MS	Outdoor temp. simulation	-	-50	50	°C
7170	MS	Customer service telephone	-			-
Inputs/outputs test						
7700	MS	Relay test No test ¦ All off ¦ Heating circuit pump Q2 ¦ Mix valve HC open Y1 ¦ Mix valve HC closed Y2 ¦ relay output QX22 module 1 ¦ relay output QX23 module 1 ¦ relay output QX21 Module 2 ¦ relay output QX22 Module 2 ¦ relay output QX23 Module 2	No test			-
7730	MS	Outdoor temperature B9	-	-50	50	°C
7732	MS	Flow temperature B1	-	0	140	°C
7840	MS	Voltage signal H1	0	0	10	Volt
7841	MS	Contact state H1 Open ¦ Closed	-			-
7845	MS	Voltage signal H2 **NOT USED**	0	0	10	Volt
7846	MS	Contact state H2 Open ¦ Closed **NOT USED**	-			-
Status						
8000	MS	Heating circuit status 1	-			-
8001	MS	Heating circuit status 2 **NOT USED**	-			-
8002	MS	Heating circuit status P **NOT USED**	-			-
8003	MS	Status DHW **NOT USED**	-			-
8004	MS	Status coolSng cSrcuSt 1 **NOT USED**	-			-

Operating line	User level	Function	Default values	Minimum	Maximum	Unit of measure
User diagnostics						
8700	MS	Outdoor temperature	-	-5	50	°C
8703	MS	Attenuated outdoor temperature	-	-50	50	°C
8704	MS	Composite outdoor temperature	-	-50	50	°C
8720	MS	Room relative humidity **NOT USED**	-	0	100	%
8721	MS	Room temperature **NOT USED**	-	0	50	°C
8722	MS	Dew point temp 1 **NOT USED**	-	0	50	°C
8730	MS	Heating circuit pump Q2 Off ¦ On	-			-
8731	MS	Heating circuit mix valve open Y1 Off ¦ On	-			-
8732	MS	Heating circuit mix valve closed Y2 Off ¦ On	-			-
8740	MS	Room temperature 1				
8743	MS	Flow temperature 1				
8751	MS	Cooling circuit pump 1 **NOT USED** Off ¦ On	-			-
8752	MS	Cooling circuit mixer 1 open **NOT USED** Off ¦ On	-			-
8753	MS	Cooling circuit mixer 1 closed **NOT USED** Off ¦ On	-			-
8754	MS	Cooling diverting valve 1 **NOT USED** Off ¦ On	-			-
8756	MS	Flow temperature cooling 1 **NOT USED**	-	0	140	°C
8760	MS	Heating circuit 2 pump **NOT USED** Off ¦ On	-			-
8761	MS	Mixing valve HC2 open **NOT USED** Off ¦ On	-			-
8762	MS	Mixing valve HC2 closed **NOT USED** Off ¦ On	-			-

Operating line	User level	Function	Default values	Minimum	Maximum	Unit of measure
8770	MS	Room temperature 2 **NOT USED**	-	0	50	°C
8773	MS	Flow temperature 2 **NOT USED**	-	0	140	°C
8800	MS	Room temperature 2 **NOT USED**				
8803	MS	Room temperature P **NOT USED**	-	0	-	°C
8830	MS	Temperature DHW1 **NOT USED**	-	0	140	°C
8930	MS	Primary control temperature **NOT USED**	-	0	140	°C
9000	MS	Flow temperature setpoint H1 **NOT USED**	-	5	130	°C
9001	MS	Flow temperature setpoint H2 **NOT USED**	-	5	130	°C
9005	MS	Water pressure H1 **NOT USED**	-	0	10	bar
9006	MS	Water pressure H2 **NOT USED**	-	0	10	bar
9050	MS	Relay output QX21 module 1 Off ¦ On	No function			-
9051	MS	Relay output QX22 module 1 Off ¦ On	No function			-
9052	MS	Relay output QX23 module 1 Off ¦ On	No function			-
9053	MS	Relay output QX21 module 2 Off ¦ On	No function			-
9054	MS	Relay output QX22 module 2 Off ¦ On	No function			-
9055	MS	Relay output QX23 module 2 Off ¦ On	No function			-

3.6 Detail of parameters

3.6.1 Setting the time and date

The adjustment device is equipped with an annual clock with time and date. In order for the adjustment device to work correctly, the time and date must be set.

Line number	*Function*
1	Hours/minutes
2	Month/day
3	Year
5	Start of summer time
6	End of summer time

- Winter/summer changeover
The set dates for the changeover from the winter period to the summer period and vice versa ensure that on the first Saturday after the set date, the time will change from 02:00 (winter) to 03:00 (summer) and from 03:00 (summer) to 02:00 (winter).

3.6.2 Control unit

Operation and display

Line number	*Function*
20	Language
22	Info Temporary Permanent
26	Controls lock
27	Lock programming
28	Direct adjustment Automatic save Save with confirmation

- Info
Temporary:
After pressing the Info button, you will see the predefined basic display after a maximum of 8 minutes or by pressing the heating mode selection button or the ESC button.

Continue:
After pressing the Info button, you will return to the new basic display after a maximum of 8 minutes. The info value selected last will be used by the new basic display.

- Control lock:
When the control lock is active, you cannot change the operating condition of the heating circuit, the room comfort setpoint (knob), or use the presence key function.

- Programming lock
When the programming lock is active, the set parameters cannot be changed, but only viewed on the display.
- Temporary deactivation of the programming lock. The programming lock can be temporarily released by pressing the buttons OK and ESC simultaneously for 3 seconds. Temporary deactivation of the lock continues until closure of the programming phase.

- Constant deactivation of programming lock. First of all, perform temporary deactivation, then go to the operating line "Programming lock" (line 27) and deactivate the programming lock.

- Direct adjustment
Automatic save:
a correction of the setpoint made with the knob takes effect either by pressing the OK key or automatically without pressing any key.

Save with confirm: a correction of the setpoint made with the knob takes effect when you press the OK key.

- Device data

Line number	*Function*
70	Software version

The display shows the current software version.

3.6.3 Programming

A changeover programme is available for the heating circuit. It is activated in "Automatic" mode and controls the level of variation of the temperature (and the setpoint) by means of the scheduled changeover times (see also page 27).

- Insertion of changeover times

The changeover times can be selected in combined mode, common to several days, or in the form of separate times for single days.
Pre-selection of groups of days, e.g. Mo...Fr and Sa... Su, makes it faster and easier to programme the changeover.

- Changeover points

Line number	*Function*
500	Pre-selection Mo – Su Mo – Fr Sa – Su Mo, Tu, We, Th, Fr, Sa, Su
501	1st period on
502	1st period off
503	2nd period on
504	2nd period off
505	3rd period on
506	3rd period off

- Standard programme

Line number	*Function*
516	Default values No Yes

The hourly programme can be set to the default values. For this purpose, an operating line is associated with the hourly heating programme to perform the reset. In this case, the previous settings will be lost

- Holiday programme

Line number	*Function*
642	Start
643	End
648	Operating level Frost protection Reduced

The holiday programme is used to change the heating mode to the desired condition based on the selected calendar days.

NB:
The holiday programme can only be used in "Automatic" mode.

3.6.4 Heating circuit

For the heating circuit, functions are available that can be set individually.

- Operating condition

The operating mode of the heating circuit is selected directly using the for the selection of the operating condition.

- Setpoints

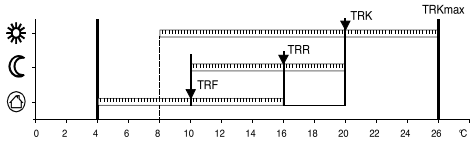
Line number	*Operating line*
710	Comfort setpoint
712	Reduced setpoint
714	Frost protection setpoint
716	Comfort setpoint max

Room temperature

The room temperature can be modified for different setpoints, which become active according to the selected operating condition.

This produces different levels of temperature in the room.

The range of the setpoints that can be modified is shown in the following diagram.



TRKmax	Max. comfort setpoint
TRK	Comfort setpoint
TRR	Reduced setpoint
TRF	Frost protection setpoint

Frost protection

Frost protection mode ensures that the room temperature does not drop below a certain limit.

This means that a room temperature will be maintained that is equal to the Frost protection setpoint. The lowest setting value is 4 °C.

Maximum comfort setpoint

This allows you to establish the maximum possible comfort setpoint (the upper limit for Comfort setpoint max is 35 °C)

- Heating curve

Line number	*Function*
720	Heating curve slope
721	Heating curve displecement
726	Heating curve adaption

The heating curve is used to generate the setpoint of the flow temperature, which is used maintain an adequate flow temperature based on climatic conditions. The curve can be corrected so you can match the production of heat with the room temperature based in individual needs.

Slope of heating curve

If the room temperature is not correct due to low outdoor temperatures and it is instead correct with high outdoor temperatures, the slope of the curve must be changed.

Increase of the curve:

The flow temperature increases more rapidly moving down towards lower outdoor temperatures.

Decrease of the curve:

The flow temperature increases less rapidly especially moving down towards lower outdoor temperatures.

The inserted heating curve is based on a room temperature of 20°C.

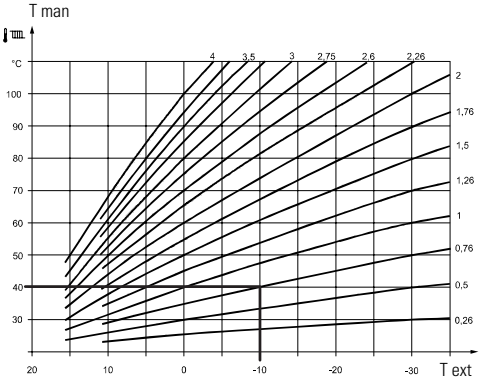
If there is a variation of the room setpoint, the heating curve automatically adapts to the new value.

To select the right heating curve, you need to know the design data of the system.

(T flow and T minimum outdoor). The intersection makes it possible to select the correct curve.

Example:

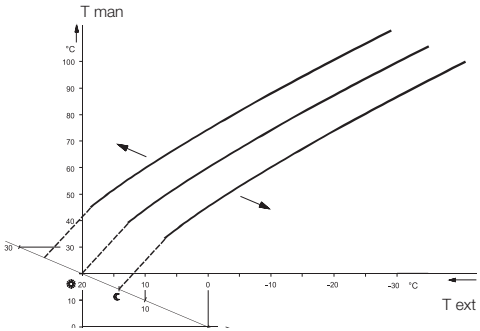
Flow temperature 40 °C, lowest outdoor temperarature -10 °C ⇒ heating curve slope = 0,76.



Note: The choice of the correct heating curve prevents system malfunctions, especially overheating which can damage heated floors.

Parallel shift of the heating curve

This is used to uniformly modify the flow temperature for the entire range of the outdoor temperature, i.e. if the room temperature is always to high or too low, you must correct the curve with the aid of the parallel shift.



Adaptation of heating curve

This is used by the adjustment device to automatically adapt the curve to the climatic conditions.
This functions adjusts the slope of the curve or its shift. When this function is active, you do not need to modify the two previous parameters (720, 711).

This function is activated if the user sets the corresponding parameter (726).

In order to activate this function, the following is necessary:
- A room remote control must be connected.
- The "ambient influence" must be set between 1 and 99% (parameter 750 - see page 48).

Note:
If the requested flow temperature is exceeded or not reached for more than 2 hours, the adaptation function will no longer be active for that day.

- **ECO functions**

Line number	*Function*
730	Limit of summer/winter changeover
732	24-hour heating limit

Limit of summer/winter changeover

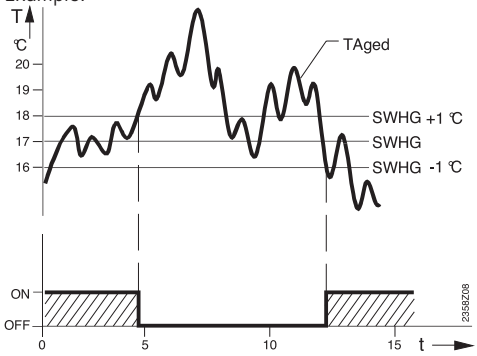
This is used to turn the heating on or off over the course of the year, based on the temperature. In automatic mode, it is turned on and off automatically, so that no manual action by the user is required.
If you modify the parameter, the corresponding time period will be reduced or extended.

Increase:
The winter function is brought forward
The summer function is postponed

Decrease:
The winter function is postponed
The summer function is brought forward

Note:
- The function is not active in "continuous comfort" mode ☼.
- The display shows "ECO".
- To calculate the dynamics of the building, the attenuated outdoor temperature is taken as a reference.

Example:



SWHG = Summer/winter changeover limit
TAged = Attenuated outdoor temperature
T = Temperature
t = Days

24-hour heating limit
This is used to activate or deactivate heating during the day, based on the outdoor temperature. This parameter is used mainly during the spring and autumn to allow the system to respond quickly to temperature variations.

Example:

Comfort setpoint (TRw)	22°C
Daily heating limit value (THG)	-3°C
Temperature (TRw - THG) heating off	= 19 °C

Changeover differential (fixed)	- 1 °C
Heating On temperature	= 18 °C

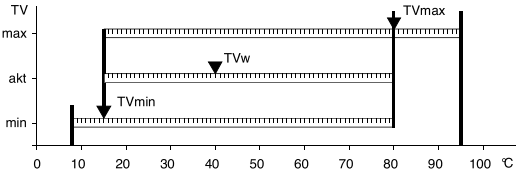
If you modify the set value, the corresponding heating periods will be extended or decreased.
Increase:
The heating function is brought forward, and the changeover to the ECO function is postponed.
Decrease:
The heating function is postponed, and the changeover to the ECO function is brought forward.

Note:
- The function is not active in "temperature continuous comfort" mode ☼.
- The display shows "ECO".
- To calculate the dynamics of the building, the attenuated outdoor temperature is taken as a reference.

- Flow temperature limit setpoint

Line number	*Function*
740	Minimum flow temperature setpoint
741	Maximum flow temperature setpoint

The limits can be sued to define a range for the flow setpoint.
If the flow temperature setpoint required by the heating circuit reaches its limit and the heat request increases or decreases, the maximum and minimum limits will not however be exceeded.



TVw Current flow temperature setpoint
TVmax Maximum flow temperature setpoint
Tvmin Minimum flow temperature setpoint

Important
Overheating of the water of the floor heating system may severely damage the slab and flooring. It is advisable to set a maximum flow water value of 45 °C, which is suitable for cement slabs and flooring such as tile, marble and hardwood.

Note
The maximum limit must not be considered as a safety device, a function which is instead performed by the safety thermostat.
The standard UNI EN 12644 requires a safety device which excludes circulation in the system when the fluid temperature exceeds 55 °C.
The maximum limit has no safety purpose. If the flow temperature exceeds this limit, the pump will be deactivated only when the flow temperature exceeds the maximum limit by more than 15%. The pump will then be reactivated when the flow temperature drops below the maximum limit.

Example:
Maximum limit = 45 °C
Switch off temperature = 45 °C + 15 % = 51,7 °C

Room influence

Line number	*Function*
750	Room influence

Type of compensation:
A room temperature sensor can have 3 different types of sensors associated with it.

Setting	*Type of compensation*
– – – %	Pure weather compensation *
1…99 %	Weather compensation with room influence *
100 %	Pure room compensation *

* The external sensor is required.

Pure weather compensation
The flow temperature is calculated from the climatic curve based on the attenuated outdoor temperature. This compensation requires correct selection of the climatic curve, since in this case the room temperature is not taken into consideration.

Weather compensation with room influence
For temperature control, all discrepancies of the room temperature from the set point are acquired and taken into consideration. Strong foreign heat sources are also considered, allows a more accurate control of the room temperature.
The better the room reference (selection of location and positioning of the probe), the better the room temperature can be satisfied.
Example:
About 60 % Good room reference conditions
About 20 % Room reference conditions unsatisfactory

In order to activate this function, the following is necessary:
- A room remote control must be connected.
- The "Room influence" must be set between 1 and 99% (parameter 750).

Pure room compensation
The flow temperature is calculated based on the room temperature setpoint, the current room temperature and the trend of the room temperature. For example, a slight increase in the room temperature will cause an immediate decrease in the flow temperature.

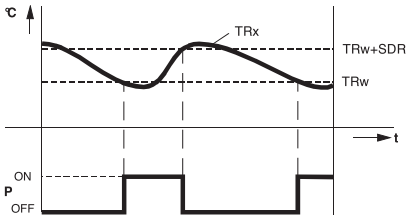
In order to activate this function, the following is necessary:
- A room remote control must be connected.
- The "ambient influence" must be set at 100 % (parameter 750).

- Room temperature limit

Line number	*Function*
760	Room temperature limit

The temperature limitation function lets you set a temperature differential for the room setpoint so that the heating pump is disconnected if the temperature increases to above that differential.
The pump of the heating circuit is again activated when the room temperature returns below the current room setpoint.
During activation of the room temperature limitation function, no heating request is made.

Note
This function is not active in the case of pure water compensation.



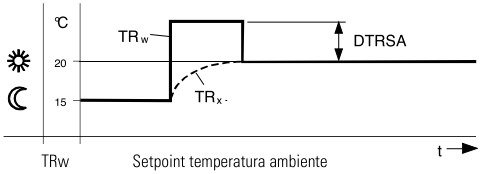
TRx Current value of ambient temperature
TRw Room temperature setpoint
SDR Room changeover differential
P Pump
T Time of day

- Boost heating

Line number	*Function*
770	Boost heating

Boost heating is used to reach the new setpoint more quickly when changing from reduced setpoint to comfort setpoint. In this way, the operating time of heating is reduced. During accelerated heating, the room temperature setpoint is increased up to the value set here. The higher this value, the less the heating time; the lower it is, the greater the heating time.

- Boost heating is permitted with or without the room unit.



TRw Setpoint temperatura ambiente
TRx Valore attuale temperatura ambiente
DTRSA Incremento del setpoint temperatura ambiente

- Quick setback

Line number	*Function*
780	**Quick setback** Off Down the reduced setpoint Down to frost protection setpoint

During quick setback the pump of the heating circuit is not in operation and the mixer valve is completely closed.

Function with room probe:
The function keeps the heating off until the room temperature has not reached the reduced setpoint or anti-freeze setpoint.
Upon reaching one of the aforementioned setpoints, the pump and the mixer valve of the circuit are reactivated.

Function without room probe:
Quick setback deactivates heating for a certain length of time, based on the outdoor temperature and the time constant of the building (line 6110 - see page 55).

Example:
Duration of quick setback if comfort setpoint minus reduced setpoint = 2°C (e.g. comfort setpoint = 20 °C, reduced setpoint =18 °C).

Composite outdoor temperature	Building time constant:						
	0h	2h	5h	10h	15h	20h	50h
15 °C	0	3.1	7.7	15.3	23	30.6	76.6
10 °C	0	1.3	3.3	6.7	10	13.4	33.5
5 °C	0	0.9	2.1	4.3	6.4	8.6	21.5
0 °C	0	0.6	1.6	3.2	4.7	6.3	15.8
-5 °C	0	0.5	1.3	2.5	3.8	5.0	12.5
-10 °C	0	0.4	1.0	2.1	3.1	4.1	10.3
-15 °C	0	0.4	0.9	1.8	2.6	3.5	8.8
-20 °C	0	0.3	0.8	1.5	2.3	3.1	7.7
	Duration of quick setback in hours						

Note.
Quick setback is possible with or without room probe.

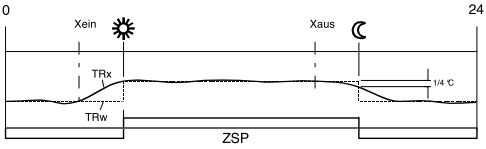
- Optimum start/stop control

Line number	*Function*
790	Optimum start control max
791	Optimum stop control max

Optimum start control max
The passage from one temperature level to another occurs in advance so that the comfort setpoint can be reached at the time of changeover.

Optimum stop control max
The passage from one temperature level to another occurs in advance so that the comfort setpoint less 1/4°C can be reached at the time of changeover.

Note
Optimization at start-up/shutdown is possible with or without room probe

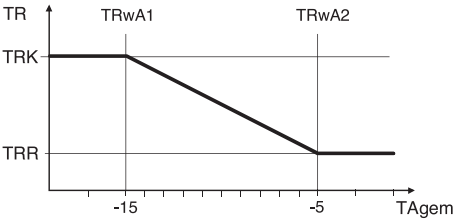


Xein Start-up time
Xaus Shutdown time
ZSP Hourly programme
TRx Current value of ambient temperature
TRw Room temperature setpoint

- Increase reduced setpoint

Line number	*Function*
800	Start increase reduced setpoint
801	End increase reduced setpoint

This function is used mainly in connection with a low-power heating system (e.g. low-energy dwellings). In this case, the heating operating time would be too long if outdoor temperatures are low. If you increase the reduced setpoint, the rooms are protected against excessive temperature drops. In addition, the time of heating operation needed to pass to the comfort setpoint is reduced.



TRwA1 Start increase reduced setpoint
TRwA2 End increase reduced setpoint
TRK Comfort setpoint
TRR Room temp. reduced setpoint
Tagem Composite outdoor temperature

- Overtemperature protection circuit pump

Line number	*Function*
820	Overtemperature prot circuit pump

For a system with a direct circuit, the temperature of flow to the circuit may be greater than that required by the climatic curve, die to the demand from other uses (mixed circuit, ACS preparation, request for external heat) or due to a minimum set boiler temperature.
An excessively high flow temperature is the result of an excessive temperature of the direct heating circuit. The "Heating circuit pump anti-overheating" function activates or de-activates the pump, ensuring that the provided energy corresponds to the actual request of the climatic curve.

- Mixing valve control

Line number	*Function*
830	Mixing valve boost
832	Type of actuator 2-position ¦ 3-position
833	Switching differential 2-pos
834	Actuator running time

Mixing valve boost
For correct mixing, the current boiler flow temperature must be greater than the setpoint of the flow temperature of the mixer valve.
Otherwise, this temperature cannot be controlled.
The adjustment device generates the boiler flow temperature based on the increase set here and according to the current flow setpoint (also see page 66).

Type of actuator
This setting determines how the control action affects the type of actuator of the mixer valve that is used (2-position, 3-position).
A 2-position actuator is controlled by one relay. A 3-position actuator is controlled by two relays (one for opening, one for closing).

Switching differential 2-pos
For the 2-position actuator the 2-position switching differential must also be adapted.
This is not required when using a 3-position actuator.
Actuator running time
Setting of travel time of the actuator of the mixer valve.
- Curing function

Line number	*Function*
850	Floor curing function Off Functional heating (Fh) Curing heating (Bh) Functional/curing heating Curing/functional heating Manual
851	Floor curing setpoint manual

The curing function ensures controlled drying of the slab.
Check the flow temperature following a certain temperature profile or a manually set temperature.

Floor curing function

Off
The function is not active.

Functional heating (Fh) DO NOT USE
The first part of the temperature profile is completed automatically.

Curing heating (Bh)
The second part of the temperature profile is completed automatically.

Functional/curing heating (Fh+Bh) DO NOT USE
The entire temperature profile is completed automatically (first and second part)

Curing/functional heating (Fh+Bh) DO NOT USE
The entire temperature profile is completed automatically (second and first part)

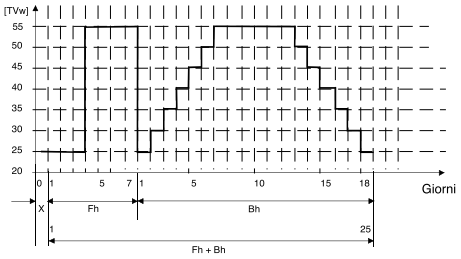
Manual DO NOT USE
A temperature profile is not followed. The slab setpoint is controlled manually.

Note:
- Comply with the standards specified by the manufacturer of the floor.
- Correct operation is ensured only in properly installed systems (plumbing system, electrical installation, parameter setting).
  The floor may be damaged if the instructions above are not followed.

- The setpoint of the flow temperature is always changed at midnight. The first day (0) which is the period between the device activation and the midnight

  is not counted in terms of drying the slab. The setpoint for that day is the same as the day of operation.

- You can interrupt the function in advance by selecting Off.
- The maximum and minimum limits of the flow temperature remain active.



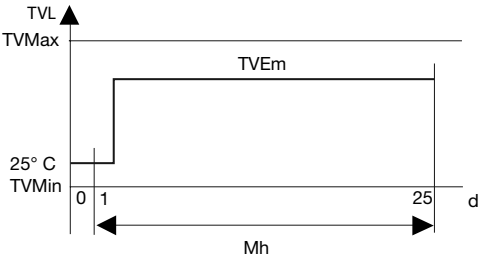
TVw	Flow temperature
X	Start day
Fh	Functional heating (7 days)
Bh	Curing heating (18 days)

Important Since the flow minimum and maximum limit remain active during the slab drying program, in order to perform drying in accordance with the selected temperature profile you must modify the set maximum flow temperature (parameter 741) to 55 °C and make sure that minimum flow temperature (parameter 740) is below 25 °C.

Note. The floor curing heating must be performed prior to installation of coverings (floors). It is advisable to use the curing heating function.

Important
Note: Heating of the floor system can occur after curing of the slab (minimum 28 days for cement slabs).
The following procedure for the first start-up of the system is applicable to slabs prior to installation of flooring materials.
Check the compatibility of the installed heating system with the programme temperatures (max 55 °C).
Failure to carry out proper verification may damage the flooring.
Check the calibration of the safety thermostat, which must be set at least at 55 °C (it has to be set again at the initial value when floor curing heating stops).

In manual mode, no temperature profile is performed. The flow temperature must be set manually (parameter 851).



TVL	Flow temperature
TVmax	Flow maximum temperature limit
Tvmin	Flow minimum temperature limit
TVEm	Slab function manual setpoint
Mh	Manual slab function duration (25 days)
d	Days

In manual mode, the function ends after 25 days or when parameter 850 is set to Off.
The first day (0) is not counted for the purposes of slab drying.
The setpoint in the manual slab function can be set in the range of values between the minimum limit and the maximum limit of the flow temperature.

Observation: If there is a power outage, the function will resume from the point where it left off.

- Remote control

Line number	*Function*
900	Operating mode changeover None ¦ Protection Mode ¦ Reduced ¦ comfort ¦ Automatic

For external changeover via an input H1, you can select the operating mode to change to.

3.6.5 Configuration

- Heating circuit

Line number	*Function*
5710	Heating circuit 1

By using this setting, you can turn the heating circuit on or off.

- Input H1

Line number	*Function*
5951	Contact type H1 NC (normally closed) - NO (normally open)

Operating mode changeover
The operating mode of the heating circuit is changed to standby via terminal H, for example using remote telephone switcher or a thermostat.

Turning the adjustment device on/off via thermostat
The room remote control-probe offers substantial advantages to the adjustment device, since all of the self-adaptation and optimization functions are the result of the difference between the setpoint temperature and the temperature actually measured by the probe.
You should however install and connect the room probe to avoid losing the functions mentioned above.
In the living room, or wherever the client prefers, the thermostat/timer thermostat of his or her choosing will be installed.
As an alternative, if the client does not want to install the room remote control-probe, it should be connected temporarily and the system should be left to run at full capacity for at least 15 days.

In this way, the adjustment device will learn the operating parameters of the system and will automatically correct the data to modify. Afterwards, disconnect the ambient probe and connect the thermostat to contacts H1 and M (see diagrams on page 17)

The adjustment device, with no room probe, will adjust the flow temperature based on the outdoor temperature and the climatic curve, which must be set carefully.

Important
When the slab drying programme is active, the activation and shutdown of the adjustment device via contact H1 are not active.

Contact type H1 (5951)
Contact NC (normally closed)
The contact is normally closed and must open for the selected function to be activated.

NO contact (normally open)
The contact is normally open and must close for the selected function to be activated.

Setting of contact logic

Contact type H1 (parameter 5951)	Contact H1 state	Effect	Selection of the operating mode button
NO	Open	The regulator works according to the mode chosen with the "Operating mode selection" button.	Enable
NO	Closed	The regulator switches according to the setting in parameter 900.	Disable
NC	Open	The regulator switches according to the setting in parameter 900.	Disable
NC	Closed	The regulator works according to the mode chosen with the "Operating mode selection" button.	Enable

NO = normally open; NC = normally closed

It is advisable to set parameter 900 (see page 53) as "Protection", parameter 5951 as "NC" and to set Automatic mode (🕘) or Comfort mode (☼) with the operating mode selection button.

Note: H1 contact state (open or closed) can be verified with parameter 7841.

- Readjustment outdoor sensor

Line number	*Function*
6100	Readjustment outdoor sensor

The measured value of the outdoor sensor can be corrected

- Building and room model

Line number	*Function*
6110	Building time constant

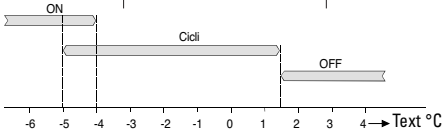
When the outdoor temperature changes, the room temperature is varied based on the thermal storage capacity of the building.
This function is used to correct the response of the flow setpoint when the outdoor temperature changes.
For a constant value:
> 20
The room temperature responds more slowly when the outdoor temperature changes.
10 ÷ 20
This setting can be used for most buildings.
< 10
The room temperature responds more quickly when the outdoor temperature changes.

- Frost protection for the plant

Line number	*Function*
6120	Frost protection for the plant

The pumps are activated based on the current outdoor temperature, even if heat is not requested.

Outdoor temperature	Pump	Diagram
...-4°C	Continuously ON	ON
-5...1.5 °C	ON for 10 minutes at intervals of 6 hours	(Cycles)
1.5°C...	Continuously OFF	OFF



In the range between -4 °C and -5 °C two cases are possible: if outdoor temperature is first lower than -5 °C and it increases then the circuit pump will be always ON. If outdoor temperature is first higher than -4 °C and it decreases then the circuit pump will cycle.

- Sensor state

Line number	*Function*
6200	Save sensors

At midnight, the base unit memorizes the status of the sensors.
After memorization, if one of the sensors is faulty, the adjustment device generates an error message.
This setting is used to ensure immediate saving of the sensors.
This is necessary when, for example, a sensor is removed because it is no longer needed.

- Parameters reset

Line number	*Function*
6205	Reset to default parameters

You can reset the default values of the parameters. The following do not include this function: time and date, control unit, and all manual setpoints.

3.6.6 LPB system

- Address/Power Supply

Line number	*Function*
6600	Device address
6601	Segment address
6604	Bus power supply function Off Automatic
6605	Bus power supply status Off On

Operating line 6600
Device address
Setting

Range	Default value
0... 16	0

Effect
The assignment of the address to the device is particularly important when using regulators in a system. The addresses classify the regulators within a segment.

Address	Effect	Example
0	Autonomous	Single Regulators
1	Master (LPB)	Regulators with master functions
2...16	Slave (LPB)	Regulators with slave functions

Address of the device
The addresses of the devices should be assigned in consecutive order in conformity with the connection of the regulators. The same address cannot be assigned several times within a segment of the bus, since this would cause communication errors. Each segment must have one device as master (address 1).

Operating line 6601
Device address
Setting

Range	Default value
0... 14	0

Effect
The assignment of the segment address is particularly important when it is used in a system. With this setting, the system can be divided into a certain number of segments.

0 Heat production segment
1...14 Heat consumption segment

All the devices in a segment must be assigned to the same segment address.
For the RC FH regulator, the segment address is always 0.

Operating line 6604

Bus supply
Setting

Range	Default value
Off/Automatic	Automatic

Bus power supply
The power supply of the bus makes it possible to directly power the bus system via the single adjustment devices (no central power supply of the bus). It is possible to select the type of power supply of the bus.
- **Off**: No power supply to the bus through the adjustment device.
- **Automatic**: The power supply of the bus (LPB) through the adjustment device is turned on and off automatically according to the needs of the LPB.

Note: It is possible to verify bus power supply state in the operating line 6605

Linea operativa 6605
Bus supply
Setting

Effect

ON	Power supply of the Bus is active. The regulator supplies power to the bus.
OFF	Power supply of the Bus is currently inactive.

- Central functions

Line number	*Function*
6620	Changeover action Segment System
6621	Summer changeover Local Central
6623	Operating mode changeover Local Central

These settings are relevant only for the device at address 1.

It is possible to define the interval of action of the centralized changeover concerning:

- Changeover of operating mode through input H1 (by selecting "Central" for operating line 6623).
- Summer changeover (by selecting "Central" for operating line 6621).

Operating line 6620
Changeover action
Setting

Range	Default value
Segment/ System	System

Effect

Segment - The switching takes place on all the regulators of the same segment.

System - The switching takes place on all the regulators of the system (in all the segments).

The regulator which activates the switching must be set as segment 0 (line 6601).

The setting concerns:

- Switching of the operating mode (via H1)
  Summer/winter switching

Operating line 6621
Summer changeover
Setting

Range	Default value
Local / Central	Local

Effect

Based on the setting, the summer/winter switching concerns either the single regulator or all the regulators of the system.

Local

The switching of the summer/winter state occurs on the regulator of the heating circuit.

Central

The winter/summer switching occurs on all the regulators of a segment (based on the setting on operating line 730).

Operating line 6623
Operating mode changeover
Setting

Range	Default value
Local / Central	Central

Effect

Defines the range of action of the operating mode switching through the input H1.

Local

The local heating circuit is turned on or off.

Central

Depending on the settings made in 6620, the heating circuits of the segment or those of the entire system are switched.

Note: The parameters 900 and 5951 must be configured in the same manner for all the regulators.

Caution

In the case of applications with Opentherm interface (Chapter 4), the parameters 6620, 6621, 6623 do not have any effect since the address 1 (master) is dedicated to the Opentherm interface device.

- **Outdoor temperature/clock**

Line number	*Function*
6640	Clock mode Autonomous Slave without remote Slave with remote setting Master
6650	Outdoor temperature source

Operating line 6640
Clock mode
Setting

Range	Default value
0... 3	0 (Autonomous)

Important: In each system, one of the regulators must be set as the system clock (setting 3).

Effect

Modifies the effect of the regulator's time adjustment on the system's time (parameters from 0 to 3).

0 Autonomous - The time nad date on the controller can be readjusted. The controller's time of date in not matched to the system time.

1 Slave without remote - The time of day on the controller cannot be readjusted. The controller's time of day is costantly and automatically matched to the system time.

2 Slave with remote setting - The time of day on the controller can be readjusted; at the same time the system time is readjusted since the change is adopted from the master. The controller's time of day is still costantly and automatically matched to the system time.

3 Master - The time of day on the controller can be readjusted. The time of day on the controller is used for the system

Operating line 6650
Outdoor temperature source

Description - When many regulators are connected, only one outdoor temperature probe is required. It can be connected to one of the regulators to send the relative signal through the bus. The regulators which have no probe connected use the outdoor temperature signal through the bus from a regulator which has a sensor connected.
Parameter 6650 displays the address of the regulator to which the external probe is connected.

Display

--.-- No external probe signal
00.01...14.16 External probe address
The first two digits represent the segment number.
The second two digits represent the device number.

3.6.7 Errors

When there is a failure an error message is displayed.
Press the button for the Info level. The cause that generated it is shown on the display.

- Reset alarm relay

Line number	*Function*
6710	Reset alarm relay

When there is an error, it is possible to activate an alarm through relay QX.. Relay QX… must be properly configured. This setting is used to reset the relay.

- Temperature alarm

Line number	*Function*
6740	Flow temperature alarm 1

The difference between the setpoint and the current temperature is monitored. A control offset will activate an error message once the set period of time has elapsed.

- Record of errors

Line number	*Function*
6800 ... 6819	History

The adjustment device stores the 10 most recent errors in non-volatile memory. The next memorization will delete the last one in memory. For each failure that is memorized, the code is saved along with the date and time it occurred.

3.6.8 Maintenance/special mode

- Maintenance functions

Line number	*Function*
7044	Maintenance interval
7045	Time since maintenance

- Manual control

Line number	*Function*
7140	Manual control

When manual control is active, the power supply of the output relays is no longer activated and deactivated according to the control status, but rather it is managed based on a predefined control status.

Setpoint adjustment with manual control
After activation of manual control, a modification occurs to the basic view of the display, on which the symbol for maintenance appears.
For the correction of the setpoint, press the Info button and go to the page "Manual mode".

- Simulation

Line number	*Function*
7150	Outdoor temperature simulation

To facilitate commissioning and troubleshooting, you can simulate an outdoor temperature between –50 and +50 °C.
During the simulation the current, composite, and attenuated temperature are replaced by the simulated temperature. At the same time, the calculation of the 3 aforementioned temperatures continues. They are once again available when the simulation is complete.
The function is deactivated by selecting -.- in the present operating line, or automatically after 1 hour.

- **Customer Service Telephone**

Line number	*Function*
7170	Customer service telephone

The phone number is shown on the display.
You can set the telephone number which is then shown on the display.

3.6.9 Inputs/outputs test

(see paragraph 3.1 "Commissioning")

Line number	*Function*
7700.... 7781	Relay test

The test of inputs and outputs is used to check the correct operation of the connected components. By selecting one of the tests, the corresponding relay is powered up, thus starting the component that is connected to it and making it possible to check for correct wiring and operation.

The value of the sensors is updated within 5 seconds. The values shown on the display cannot be modified.

3.6.10 System status

Line number	*Function*
8000	Heating circuit status 1

The display show the current operation of the system.

3.6.11 Consumer diagnostics

Line number	*Function*
8700 ... 9099	

To perform diagnostics you can view the various setpoints, the current values, the status of the relays and the reading of the meter.

3.6.12 List of displays

Error code

Code	Description of error
0	No error
10	Outdoor temperature sensor
20	Temperature sensor boiler 1
25	Temperature sensor for solid fuel boiler
26	Common flow temperature sensor
28	Flue gas temperature sensor
30	Flow temperature 1 sensor
31	Flow temperature cooling 1 sensor
32	Flow temperature 2 sensor
38	Flow temperature primary controller sensor
40	Return temperature 1 sensor
46	Return temperature cascade sensor
47	Common return temperature sensor
50	DHW temperature 1 sensor
52	DHW temperature 2 sensor
54	DHW primary controller sensor
57	DHW circulation temperature sensor
60	Room temperature 1 sensor
65	Room temperature 2 sensor
68	Room temperature 3 sensor
70	Buffer storage tank temperature 1 sensor
71	Buffer storage tank temperature 2 sensor
72	Buffer storage tank temperature 3 sensor
73	Collector temperature 1 sensor
74	Collector temperature 2 sensor
81	Short circuit LPB
82	LPB address collision
83	BSB wire short circuit
84	BSB address collision
85	BSB radio communication fault
98	Extension module 1 fault (failure condition message)
99	Extension module 2 fault (failure condition message)
100	2 clock time masters (LPB)
102	Clock time master without backup (LPB)
105	Maintenance message
109	Boiler temperature supervision
110	SLT lock
117	Upper pressure limit 1
118	Water pressure too low (critical limit)
121	Flow temperature supervision 1 (HC1)
122	Flow temperature supervision 2 (HC2)
126	DHW charging supervision
127	Legionella temperature not reached
131	Burner faulty
146	Common error message configuration
171	Alarm contact 1 (H1) active
172	Alarm contact 2 (H2) active
173	Alarm contact 3 (EX2/230VAC) active
174	Alarm contact 4 (H3) active
176	Upper pressure limit 2
177	Water pressure 2 too low (critical limit)
178	Temperature control of heating circuit 1
179	Temperature control of heating circuit 2
207	Cooling circuit error
217	Sensor error common message
218	Pressure supervision common message
241	Flow probe, solar probe error
242	Return probe, solar probe error
243	Swimming pool temperature sensor
320	DHW charging temperature sensor
321	Istantaneous DHW heater outlet temperature sensor
322	Upper pressure limit 3
323	Water pressure 3 too low
324	BX same sensors

325	BX/extension module same sensors
326	BX/mixing valve group same sensors
327	Extension module same function
328	Mixing valve group same function
329	Extension/mixing valve group module same function
330	Sensor BX1 no function
331	Sensor BX2 no function
332	Sensor BX3 no function
333	Sensor BX4 no function
334	Sensor BX5 no function
335	Sensor BX21 no function
336	Sensor BX22 no function
337	Sensor BX11 no function
338	Sensor BX12 no function
339	Collector pump Q5 missing
340	Collector pump Q16 missing
341	Collector sensor B6 missing
342	Solar DHW sensor B31 missing
343	Solar integration missing
344	Solar controlling element buffer K8 missing
345	Solar contr.element swimm pool K18 missing
346	Solid fuel boiler pump Q10 missing
347	Solid fuel boiler comparison sensor missing
348	Solid fuel boiler address error
349	Buffer return valve Y15 missing
350	Buffer storage tank address error
351	Address error primary control/system pump
352	Address error comm. Hyd
353	Cascade sensor B10 missing
357	Monitoring of flow temperature cooling circuit 1
366	Error room temperature probe Hx
367	Error room humidity probe Hx

Maintenance codes

Code	Description of error
1	Excessive burner operating hours
2	Excessive burner start-ups
3	Excessive maintenance interval
5	Water pressure in heating circuit too low (pressure below lower limit 1)
18	Water pressure in heating circuit too low (pressure below lower limit 2)
10	Replace the battery of the external probe
21	Excessive maximum temperature of flue gas
22	Water pressure in heating circuit too low (pressure below lower limit 3)

Special function codes

Code	Description of error
301	Manual operation
302	Test SLT
303	Chimney sweeper function
309	Outdoor temperature simulation
310	Alternative energy operation
314	Economy mode

3.7 Adjustment and balancing of the system

The adjustment of the stopper on the bypass branch (see fig. 1) makes it possible to create a pressure drop that is sufficient to force injection of hot water through the mixer valve.

Practical method

1 Completely open the stopper.

2 Select manual operating mode.
The circulator pump is active. The servo-control of the valve is deactivated.

3 Manually turn the knob of the servo-control until it is all the way open.

4 Check the flow temperature of the system and close the stopper of the bypass until the water temperature reaches the system limit temperature.

5 Wait for the system to come up to speed and check that the temperature differential between delivery and return of the floor system is the designed one.

6 If necessary, use the calibration stopper of the bypass as follows:

A Temperature difference too high. Flow rate insufficient. Gradually open the stopper until the design temperature difference.

B Temperature difference too low. The differential pressure of the bypass deviation is insufficient. Close the stopper gradually so as to achieve a differential pressure which allows injection of the high temperature fluid coming from the boiler.

3.8 Protective functions of the system

The adjustment device performs important frost and anti-seizing functions for the pump.

Important
These functions are active if the adjustment device is electrically powered.
It is advisable not to disconnect the power supply to the adjustment device, so as not to lose the date/time setting and the protection functions.

- Room frost protection
This function is active in standby operating mode. It prevents the ambient temperature from dropping below the value set in operating line 714, see page 46.

- Frost protection for the system
The circuit pump is activated if the external temperature drops below 1.5°C, as shown in the following diagram:

Outdoor temperature	Pump
…–4 °C	Always ON
–5…1.5 °C	ON for 10 minutes, at intervals of 6 hours
1.5 °C…	OFF

Note: outdoor sensor must be connected

See page 55.

- Frost protection for heating circuit
If the temperature measured by the flow probe drops below 5 °C, which represents the frost protection set-point for the flow, a request for heating is generated.
This causes activation of the pump of the circuit and of the mixer valve until the water reaches a temperature of 7°C.
This function is activated regardless of the active operating mode, if the holiday programme is active or the parts in ECO.

- Pump anti-seizure
The pump of the circuit is activated for 30 seconds every Friday morning at 10:00.

3.9 Operating anomalies

The display of the adjustment device is off.	- Is the system electrically powered? - Are the fuses in order? - Check the wiring
The adjustment does not work. The time of day is not shown, or the displayed time is not correct.	- Check the system fuses. - Reset: disconnect the mains power supply to the adjustment device for about 5 seconds. - Set the correct time on the adjustment device (line 1).
The mixer valve does not open/close, or does not work correctly.	- Connections to adjustment device interrupted (see output test). - Check the wiring of the thermal sensors (input test). - Check the setting parameters.
The pump of the heating circuit does not function.	- Check the wiring and fuse (see output test). - Check the wiring of the thermal sensors (input test). - Check the setting parameters. - Check whether the safety thermostat has tripped.
Ambient temperature does not reach the requested value.	- Check the ambient temperature set point. - Is the operating condition specified? - Is automatic operation modified by the room remote control? - Are the correct day of the week, time of day and heating programme displayed? - Is the slope of the heating curve (line 720) correct? - Check the connections of the external sensor. - Check whether the slab drying programmed is active.
The anti-freeze function of the system does not function fully, or does not work correctly.	- Check that the pumps are working properly.

LPB/Open Therm

4.1 Instructions for installation and use of LPB/ Open Therm gateway

Interface (gateway) for integrating boiler adjustment devices with OpenTherm (OT) or Boiler Management Units (BMUs) in the system Local Process Bus (LPB).

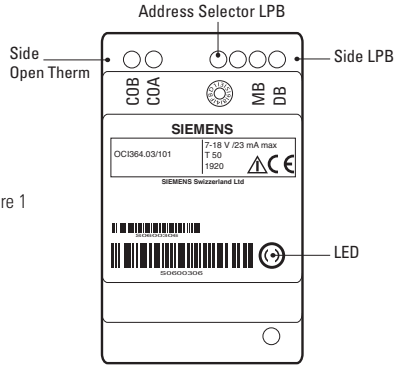
CONNECTIONS
Connect the adjustment devices to the LPB (Bus) backbone using the connectors MB = Ground and DB = Data Bus (violet) and to the OpenTherm interface (terminals MB and DB).
The cables are NOT interchangeable.

Connect the OpenTherm interface (terminals COA, COB) to the contacts dedicated to the terminal board of the boiler (for the Emmeti Nina boiler – terminals 1 and 2). The cables are interchangeable.
The LPB address (address from 1 to 16) can be selected with the rotating selector (see picture 1). To access the selector, unhook the cover. Address 1 is reserved for the LPB master unit. Addresses 2 to 16 represent the respective slave units.

COA, COB
Contacts for OpenTherm. - Interchangeable cables.

MB, DB
Contacts for LPB, DB = Data Bus, MB = Ground. Cables NOT interchangeable.

LED
The operating status of the interface is indicated by a green LED. During normal operating status, the LED flashes briefly during communication.
If the bus is short circuited or the circuit is interrupted (not powered), or when communication with the boiler card is not possible, the LED stays on steady.
Other malfunctions may only be transmitted and indicated by LPB.



Picture 1

Settings of parameters

Interface OT > address = 1 (*Master*)

Adjustment device(s) RC FH

Parameters
parameter 6601=0
parameter 6600=2...16 (Slave);

Parameter 830 = defines the increase in boiler temperature beyond the calculated value for the mixture circuit (default setting = 5 °C).

Example: parameter 830 = 10 °C;
if the set point of the mixture circuit (floor-installed mixer) is = 40 °C, the boiler works with a flow temperature= 40 + 10 = 50 °C.

Operating line 830
Boost of the mixing valve

Description
By adding the return water from the system to the flow water of the boiler, the variations of the temperature of the boiler will be reduced, allowing the mixing valve to produce constant flow temperatures.

In any case, to achieve the desired mixture, the actual value of the flow temperature of the boiler must be greater than the required set point of the mixture temperature.
If this is not respected, the set point cannot be reached during the required period of time.

Setting

Range	Default setting
0...50 °C	5 °C

Effect
The parameter increases the set point temperature of the boiler when the adjustment device requires heat.
The adjustment device generates the set point temperature of the boiler based on the boost which can be set with this parameter and on the set point of the flow temperature of the mixed zone: the greater the temperature difference between the boiler flow and the mixed circuit flow, the faster the required set point can be reached.

TVw	Set point temperature of the mixed zone
Parameter 830	Boost
Total (TVw + Parameter 830)	Boiler set point temperature

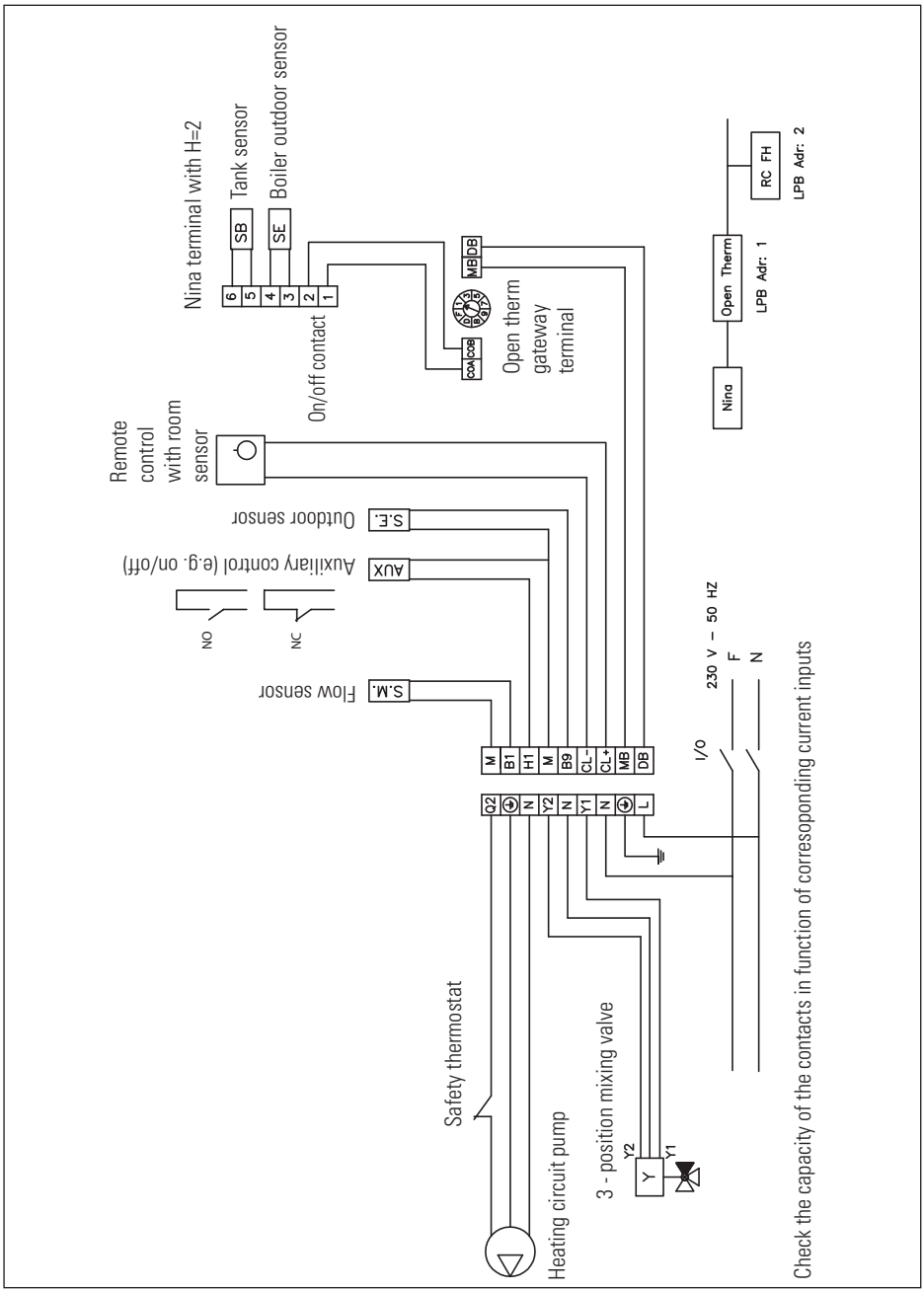
Example: parameter 830 = 10 °C;
if the set point of the mixture circuit (floor-installed mixer) is 40 °C, the boiler works with a flow temperature = 40 + 10 = 50 °C.

Note: to enable this function, is necessary install OpenTherm interface.

Note: In the case of more mixing zones, the zone with the highest demand determines the setpoint temperature of the boiler.

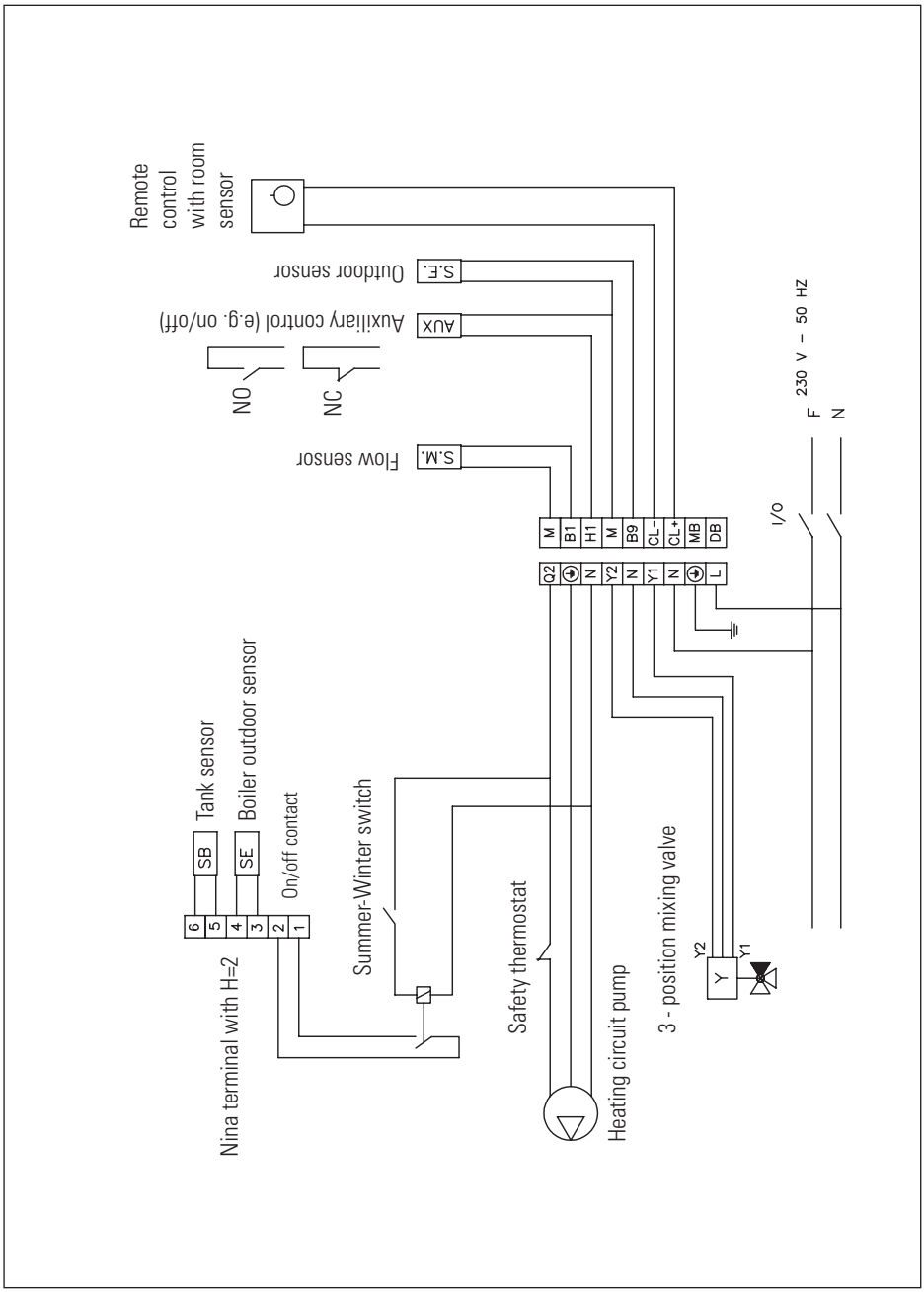
Technical data		
Supply	Power supplied by Open Therm bus	
Functional data	Software class	A
Interfaces: caracteristics of cables	OpenTherm Bus	2-cables (interchangeable)
	Maximum length of cables	50 m
	Resistance of cables	max. 2 x 5 Ω
	LPB bus	2-cables (NOT interchangeable)
	Maximum length of cables	copper cable 1.5 mm^2: 460 m
	With power supply of bus supplied by adjustment device	250 m
	With power supply of the central bus	460 m
	Loading number of Bus	E = 3
Degree of protection and class of safety	Degree of protection of the covering (EN 60529)	IP 20
	Class of protection according to EN 60529	Parts that transport low voltage are within the requirements of safety class II, if installed correctly
	Class of safety accorging to EN 60730	normal contamination
Norms	EC conformity according to	
	EMC directives	89/336/EWG
	- Immunity	- EN 61000-6
	- Emissions	- EN 61000-6
	Low voltage directive	73/23/EWG
	- Electrical safety	- EN 60950, EN 60925
Environmental conditions	Storage (IEC721-3-1 class 1K3)	temperature -25...70 °C
	Transport (IEC721-3-2 class 2K3)	temperature -5...55 °C
	Operation (IEC721-3-3 class 3K5)	temperature 0...50 °C
Weight	(not including packaging)	76 g

Connection diagram of adjustment device RC FH, Open Therm gateway and Emmeti Nina Boiler

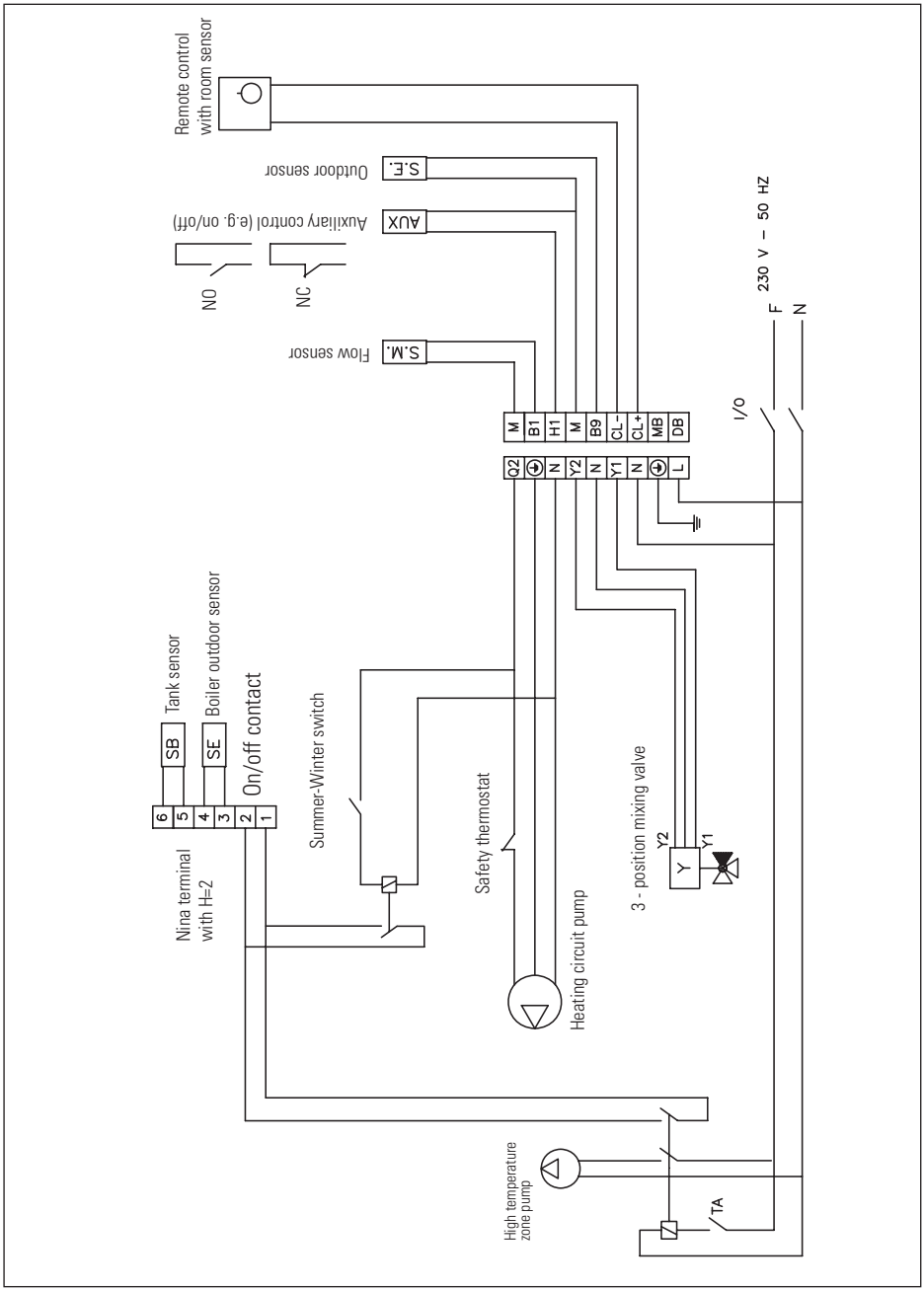


GB

Connection diagram of adjustment device RC FH and Emmeti Nina boiler with on/off contact

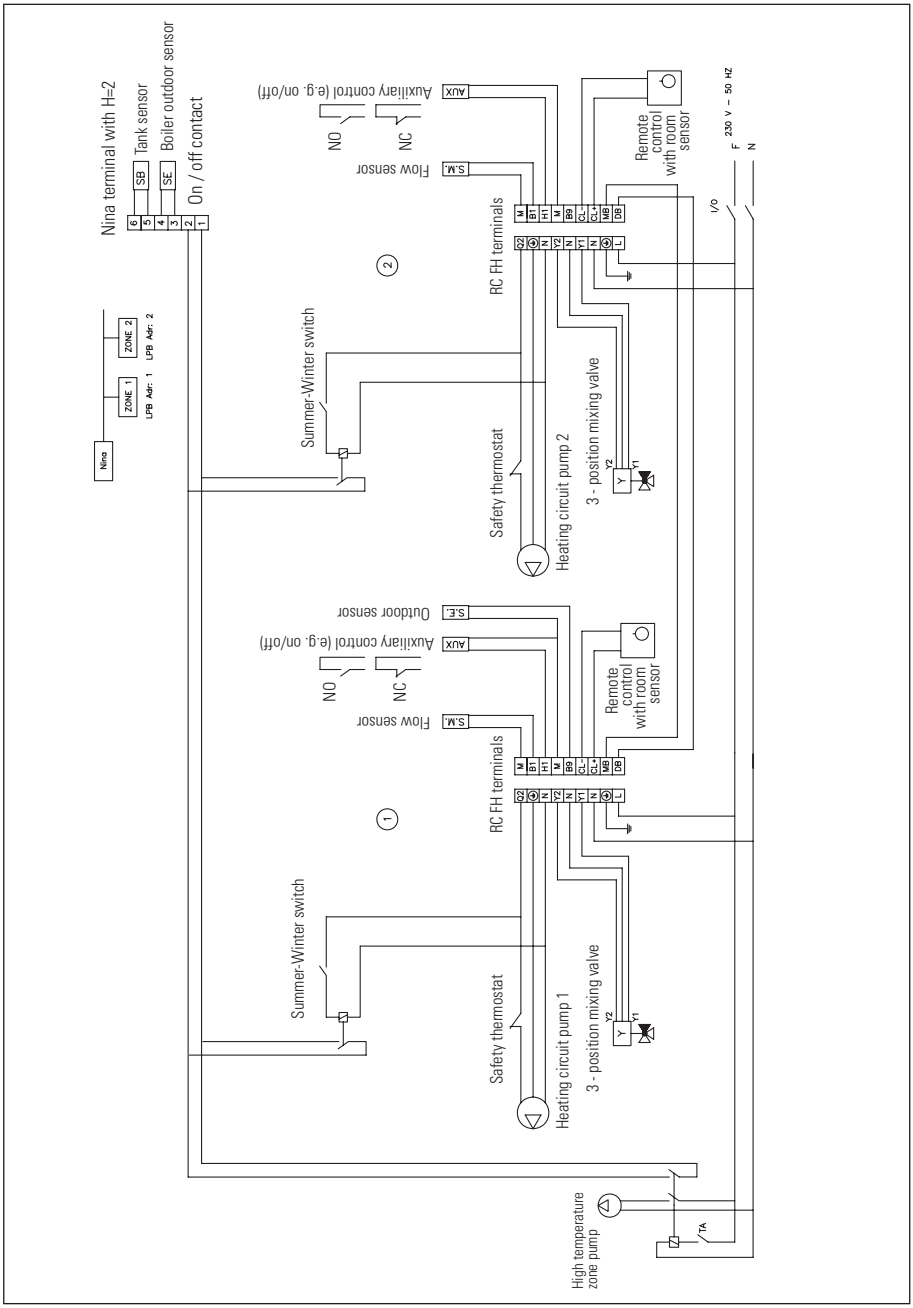


Connection diagram of adjustment device RC FH and Emmeti Nina boiler with on/off contact and one higt temperature zone

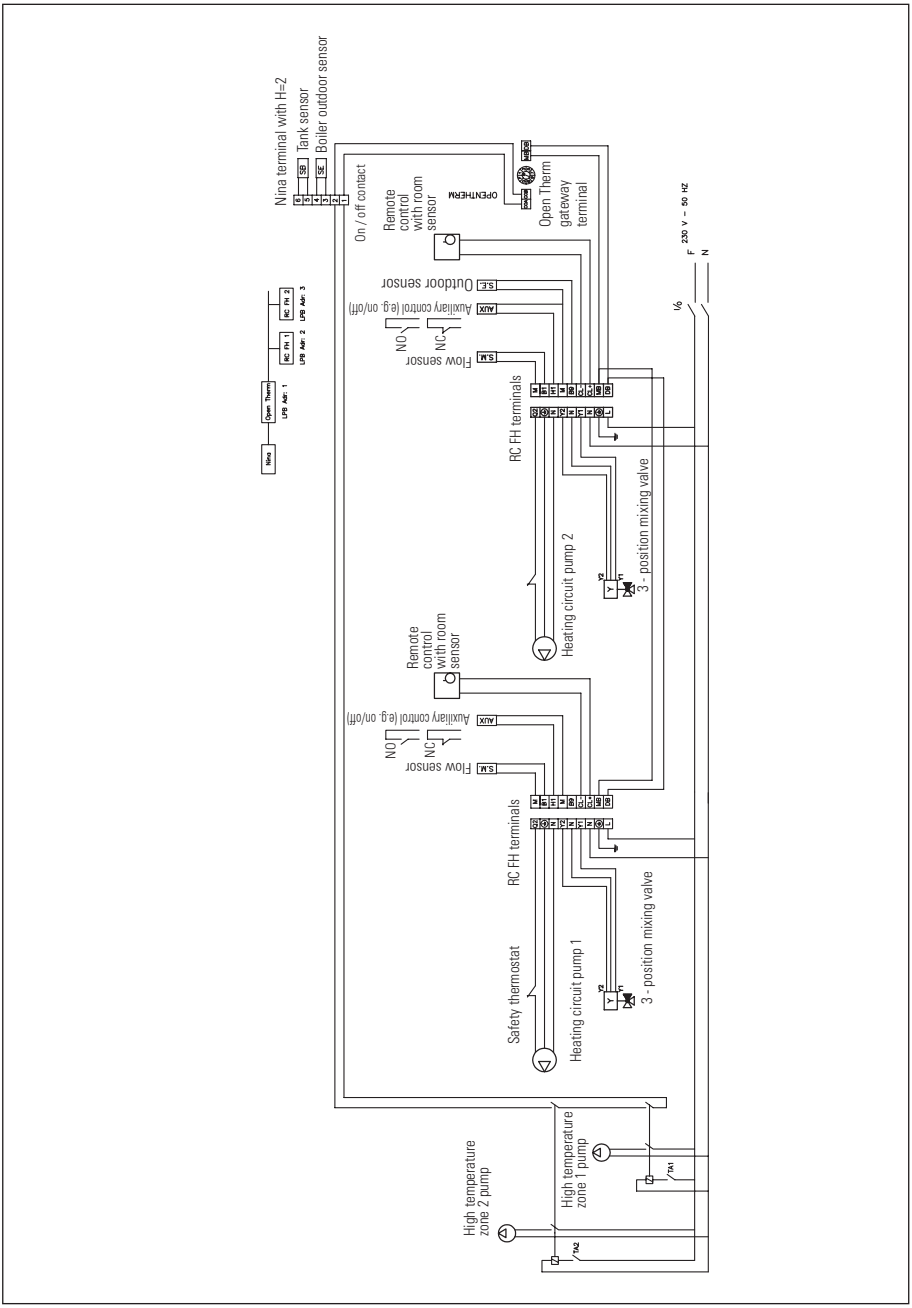


GB

Connection diagram of two adjustment devices RC FH, Emmeti Nina boiler with on/off contact and one higt temperature zone



Connection diagram of two adjustment devices RC FH, Emmeti Nina boiler, Open Therm gateway and two high temperature zones



Respect the environment!

For a correct disposal, the different materials must be divided and collected according to the regulations in force.

Rev. A - 04.2011 - Ufficio Pubblicità e immagine/Emmeti Spa - A.M.

9004300200001

EMMETI Spa
Via B. Osoppo, 166 - 33074 Vigonovo frazione di Fontanafredda (PN) - Italy
Tel. 0434-567911 - Telefax 0434-567901
Internet: http://www.emmeti.com - E-mail: info@emmeti.com